

A study on injury pattern among the pedestrians of road traffic accidental deaths

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Abstract

Background: Road Traffic Accident (RTA) is one among the top 5 causes of morbidity and mortality in South-East Asian countries. RTAs are important causes of mortality and morbidity in India¹. The study was to evaluate the pattern and distribution of injuries among pedestrians who died in road traffic accidents as per the autopsy reports of the Mortuary, District Hospital, Eluru. **Material and Methods:** This was a descriptive study and the data was collected from the mortuary records of the District Hospital, Eluru. The victims were said to have died of vehicular accidents during the period from 1st January 2016 to 31st December 2017. **Results:** The study revealed the most common site of primary impact injuries to the pedestrian victims by the vehicles was lower limb- legs 45.58 p.c followed by both head and face and upper limbs which were 17.64 p.c. The most common site of secondary impact injuries was head and face 29.41 p.c followed by chest and shoulders 13.23 pc. The most common site of secondary injury was on the head and face 67.64 p.c followed by upper limbs 33.82 p.c. **Conclusion:** The study shows pedestrian accident victims have male preponderance and most accidents occurred on highways according to demographic data. The most common site of primary impact injury was on legs and injury was abrasion, though there were fewer occurrences, most common site of secondary impact injury was head and face and injury was contusion and most common site of secondary injuries was head and face and type of injury was abrasion. The study also found that the most common cause of death was head injury. The present research shows pedestrian accidents are of concern and continue to be important public health problem in and around Eluru city and in many cases pedestrian accidents are caused by human errors and are preventable.

Key Word: road traffic accident.

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Received Date: 05/11/2018 Revised Date: 19/12/2018 Accepted Date: 12/01/2019

DOI: <https://doi.org/10.26611/1018911>

Access this article online

Quick Response Code:



Website:

www.medpulse.in

Accessed Date:

17 January 2019

INTRODUCTION

Road Traffic Accidents (RTAs) are important causes of mortality and morbidity due to the increasing number of vehicles, changes in lifestyle and the risk behaviors among the population. According to WHO Global status report on road safety² 2018, about 1.35 million people die on the world's roads and 20-50 million are injured every year. Road traffic crashes are major causes of death among all age groups and the leading cause of death for children and young adults aged between 5-29 years. Over

half of all road traffic deaths are among pedestrians, cyclists and motorcyclists. Road traffic crashes result in economic losses to victims and their families, often throwing them into poverty. Road traffic injuries are the 8th leading cause of death in the world. Every 24 seconds someone dies on the road. In the year 2018, 1,354,840 all road users, 392,904 car users, 379,356 motorcyclists, 311,614 pedestrians, 40,646 cyclists have died in the world. According to the WHO, India has reported mortality rate from road traffic injuries as 18.9 per 100,000 people and 100 road fatalities per 100,000 vehicles². Road Traffic Accident (RTA) is one among the top 5 causes of morbidity and mortality in South-East Asian countries. RTI accounts for 30 to 86 p.c of the trauma admissions to hospitals in low income and middle income countries like India. Pedestrians account for twenty two percent among the road traffic accidental deaths. India is passing through a major epidemiological transition and technological revolution during the past two decades. This has led to a rapid growth in motorization and concomitant increase in road traffic

How to cite this article: Mynedi Seetharamaiah, Pramod Kumar Koyyalamudi, Punuri Sanjay. A study on injury pattern among the pedestrians of road traffic accidental deaths. *MedPulse International Journal of Forensic Medicine*. January 2019; 9(1): 01-03. <https://www.medpulse.in/Forensic%20Medicine/>

injury (RTI) related mortality. In actual numbers, 4,64,674 road accidents caused 1,48,707 deaths and injuries to 4,82,389 persons during 2015. In India, deaths per 100000 people in pedestrians is 2.3¹

OBJECTIVES

1. To evaluate the pattern and distribution of injuries among pedestrians who died in road traffic accidents.

2. To study the most common fatal injury among pedestrians.

MATERIALS AND METHODS

This was a record based descriptive study. All the autopsies taken for the study were done in the mortuary, District Hospital, Eluru. The victims were said to have died of vehicular accidents during the period from 1st January 2016 to 31st December 2017.

RESULTS

Table 1: Sites of injuries in pedestrians

Site	Primary impact Injuries		Secondary Impact Injuries		Secondary injuries	
	Number	Percentage	Number	Percentage	Number	Percentage
Head and face	12	17.64%	20	29.41%	46	67.64%
Chest and shoulders	08	11.76%	09	13.23%	22	32.35%
Abdomen	08	11.76%	05	7.35%	04	5.88%
Pelvis	11	16.17%	01	1.47%	01	1.47%
Upper limbs	12	17.64%	06	8.82%	23	33.82%
Lower limbs- Thighs	07	10.29%	01	1.47%	19	27.94%
Lower limbs- Legs	31	45.58%				
No injuries	Nil	Nil	36	52.94%	02	2.94%

A total of 782 medico legal autopsies were conducted during the study period. Road traffic fatalities alone accounted for 37 p.c (289) of all autopsied cases. Among them 68 cases were pedestrians. Primary impact injuries were common in lower limbs - Legs with 45.58 p.c (31) followed by upper limbs 17.64 p.c (12) and head and face 17.64 p.c (12). Secondary impact injuries were found among 47.06 p.c (32). In cases where secondary impact injuries were present, most commonly affected part was head and face with 29.41 p.c (20) followed by chest and shoulder 13.23 p.c (9) and upper limbs 8.82 p.c (6). Secondary injuries were common in head and face with 67.64 p.c (46) followed by upper limbs 33.82 p.c (23) and chest and shoulder 32.35 p.c (22). Basing on this subdivision of injuries, it was concluded that head and face are commonly affected part of the body, (Table 1).

Table 2: Types of Injuries in Pedestrians

Injuries	Primary Impact Injuries		Secondary Impact Injuries		Secondary injuries	
	Number	Percentage	Number	Percentage	Number	Percentage
Abrasion	56	82.35%	19	27.94%	55	80.88%
Contusion	30	44.11%	24	35.29%	45	66.17%
Laceration	15	22.05%	07	10.29%	14	20.58%
Fracture	30	44.11%	10	14.70%	21	30.88%
Dislocation	01	1.47%	01	1.47%	-	-
Crush injury	-	-	-	-	06	8.82%
No injuries	-	-	36	52.94%	02	2.94%

The most common type of injury in primary Impact injury among 68 victims of pedestrians was abrasion 82.35 p.c (56), followed by fractures and contusions, each 44.11 p.c (30). The most common type of injury in secondary Impact injury was contusion 35.29 p.c (24) followed by abrasion 27.94 p.c (19). The most common type of secondary injury was abrasion 80.88 p.c (55) followed by contusion 66.17 p.c (45). This shows multiplicity of injuries amongst the pedestrian victims, (Table 2).

DISCUSSION

The present study revealed the most common site of primary impact injuries to the pedestrian victims by the vehicles was lower limb- legs 45.58 p.c followed by both head and face and upper limbs which were 17.64 p.c. According to a study by Birendra Kumar Mandal and Biswa Nath Yadav the most common site of primary

impact injury was lower extremities (34.5%) in concurrence with our study and followed by thorax (16.4%), pelvis (14.7%), upper extremities (13.1%), buttocks (11.5%), head and neck (3.3%), and abdomen (1.6%) which were slightly deviating from our study results³. In our study, the most common site of secondary impact injuries was head and face 29.41p.c followed by

chest and shoulders 13.23 pc. According to the study by Birendra Kumar Mandal and Biswa Nath Yadav, maximum secondary impact injuries found in head and neck (27.6%) in concurrence with our study and followed by lower extremities (25%), upper extremities (21.1%), whereas in pelvis, thorax, abdomen, back, and buttocks there were having least involvement of injuries which were slightly deviating from our study results³. The most common site of secondary injury was on the head and face 67.64 p.c followed by upper limbs 33.82 p.c.). According to the same study by Birendra Kumar Mandal and Biswa Nath Yadav, maximum secondary injuries were recorded in lower extremities (25.5%) followed by head and neck (23.4%), back and upper extremities (15.3% each), buttocks (9.2%), pelvis (6.1%), thorax (3.1%), and abdomen (2.1%) which were not in concurrence with our study observations. A study done by K. Kibayashi *et al.* among pedestrians and bicyclists there was a higher rate of head injuries, such as skull fractures, epidural haemorrhage, subdural haemorrhage, brain contusion, and injuries of the lower extremities⁴. According to Pruthi, Nupur *et al.* about 55.2p.c of pedestrians sustained moderate or severe head injury (GCS - 3 to 13)⁵. In our study majority of primary impact injuries were abrasions 82.35 p.c. followed by fractures and contusion 44.11 p.c. each, followed by lacerations 22.05 p.c. in contrast with the study reports of Birendra Kumar Mandal and Biswa Nath Yadav where majority (28.9%) of the injuries sustained in the victims were fracture followed by laceration (26.3%), abrasion (23.2%), and contusion (21.6%)³. According to the study by Singh and Dhatarwal, fractures/ dislocation and lacerations were most commonly observed with 89.1p.c and 88.8p.c of cases respectively followed by abrasions (84.4%)⁶.

CONCLUSION

The study shows pedestrian accident victims have male preponderance and most accidents occurred on highways according to demographic data. The most common site of primary impact injury was on legs and injury was abrasion, though there were fewer occurrences, most common site of secondary impact injury was head and face and injury was contusion and most common site of secondary injuries was head and face and type of injury was abrasion. The study also found that the most common

cause of death was head injury. The present research shows pedestrian accidents are of concern and continue to be important public health problem in and around Eluru city and in many cases pedestrian accidents are caused by human errors and are preventable. Head injuries are responsible for death of majority of victims along with thoraco-abdominal trauma and extremities. The health care system needs to be strengthened especially provision of emergency care services 24x7 should be expanded and strengthened. Curative services also need to be improved like trauma care ICUs to be fully equipped and full staffed. As pedestrians are vulnerable road users, steps to be taken to protect them from accidents. Health education to be promoted by media, hoardings and posters regarding adequate road safety measures. Traffic laws should be strictly implemented. Roads traffic polices like pedestrian friendly paths, foot over bridges, underground pathways, separate lanes for light, heavy motor vehicles and two wheelers can reduce incidence of pedestrian accidents and its fatalities. The pedestrians should be advised to cross roads only at zebra crossings on national high ways and other roads, follow traffic signals and observe vehicle movement.

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Source of Support: None Declared
Conflict of Interest: None Declared