

# An autopsy study of thoracic injuries in road traffic accidents

Mohan Gushinge<sup>1\*</sup>, Mahadev Bansode<sup>2</sup>, Radhey Khetre<sup>3</sup>

<sup>1</sup>Assistant Professor, Department of Forensic Medicine, Dr. S. C. G. M. C. Nanded, Maharashtra, INDIA.

<sup>2</sup>Associate Professor, <sup>3</sup>Assistant Professor, Department of Forensic Medicine, Government Medical College, Latur, Maharashtra, INDIA.

Email: [sonal.govindwar@gmail.com](mailto:sonal.govindwar@gmail.com)

## Abstract

Road traffic accidents are among the most common cause of death in India. According To WHO statistics it is the 9<sup>th</sup> leading cause of death in 2004 and projected to be the 5<sup>th</sup> leading cause by 2030. One among road traffic accidents (RTA) deaths, two wheeler accidents are common, followed by pedestrians. Pedestrian forms the most vulnerable group among road users. The current study was done for a period of three years on road traffic accidents. The incidence was common among the age group of 21 to 30 years with male predominance. Majority of individual died on spot without receiving any preliminary treatment. More commonly injured organ in thoracic region were lungs (76.31%), and rib fracture was the most common skeletal injury associated.

**Key Words:** RTA.

## \*Address for Correspondence:

Dr. Mohan Gushinge, Assistant Professor, Department of Forensic Medicine, Dr. S. C. G. M. C. Nanded, Maharashtra, INDIA.

Email: [sonal.govindwar@gmail.com](mailto:sonal.govindwar@gmail.com)

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## INTRODUCTION

Birth and death are the two extremes of the life and death is the ultimate truth. But unnatural death is known for its immense striking shock. Deaths due to road traffic accidents are one of the common forms of unnatural death and its history is as old as the invention of the wheel.<sup>1</sup> More than 1.3 lakhs people died on Indian roads, giving India the dubious honor of topping the list of road deaths across the world. With just 1% of the world's vehicles, India manages to account for 10% of its road fatalities<sup>2</sup>. Road traffic accidents may causes injuries to all body parts. Here we carried study in relation to thoracic injuries. Since the thoracic cavity contains the vital organs like heart, lungs, major blood vessels, ribs, etc,

trauma to this region challenges the integrity and even the viability of the individual. It is a leading cause of death in approximately 25% of trauma patients and, when associated with other injuries, it causes death in additional 50% of multiple trauma patients, usually as a result of hypoxia and hypovolemia. When cardiac trauma is not involved, mortality from isolated penetrating chest injury is low (<1%), but if cardiac trauma is present, mortality rises to about 20%.<sup>3</sup>

## MATERIAL AND METHOD

The present study was conducted in the department of forensic medicine and toxicology, of tertiary care centre, Government Medical College and Hospital, Latur. The study was carried out during the period of 2 years from 1<sup>st</sup> October 2012 to 30<sup>th</sup> September 2014. Here the cases of Road traffic accidents involving thoracic region during mentioned period were selected for study.

## RESULTS

Table no. 1 shows, the males between the age group 21-30 years i.e. 26 victims (26.53%), more vulnerable. Females were more vulnerable in the age group 51-60 yrs i.e. 5 victims (31.25%). Table no. 2 shows the maximum no. of victims i.e. 48 (42.10%) were died on the spot or brought death to the hospital. Table no. 3 shows the

Lungs were injured or involved in maximum no. of victims i.e. 87 cases (76.31%), followed by the heart i.e. in 24 cases (20.17%). Ribs were fractured in 78 (68.42%) cases, followed by the sternum, in 17 (14.91%) cases. Table no. 4 shows, Both the lungs were having maximum injury of contusion, 64.29% cases in right lung and 35.71% in left lung. In all 24 cases of heart injury, laceration was more common injury i.e. in 14 cases (58.33%) and contusion was involved in 10 cases

(41.67%). Table no. 5, shows the Maximum no. of injury cases to lung and heart were associated with rib fractures. In 76 (87.35%) cases of lung injury out of total 87 cases, rib fracture was involved and out of 23 cases of heart injury in 19 (82.60%) cases rib fracture was associated. After applying the chi square test, p value was more than 0.05. which shows the relation between rib fractures and injury to lung and heart was non-significant.

**Table 1:** Age wise and sex wise distribution of victims (n=114)

Age groups in year	Male	Female	Total	Percentage
1-10	1	2	3	2.60%
11-20	10	0	10	8.77%
21-30	26	2	28	24.56%
31-40	23	2	25	22.0%
41-50	15	2	17	14.91%
51-60	10	5	15	13.15%
61-70	12	0	12	10.52%
>70	1	3	4	3.50%
<b>Total</b>	<b>98 (85.96%)</b>	<b>16 (14.04%)</b>	<b>114</b>	<b>100%</b>

**Table 2:** Correlation between survival period and victims of different age group (n=114)

Survival period	Cases
Spot death/ brought death	48 (42.10%)
1-59 min	12 (10.52%)
1 hr-5.59 hr	36 (31.57%)
6 hr- 11.59 hr	2 (1.75%)
12hr-23.59hr	1 (0.87%)
1 day- 2 days	7 (6.14%)
2-7 days	5 (4.35%)
7-15 days	3 (2.6%)

**Table 3:** Involvement of thoracic organs in victims (n=114)

ORGAN	CASES	OUT OF TOTAL
Lung	87 (76.31%)	114
Heart	24 (21.05%)	114
Bronchus	12 (10.52%)	114
Trachea	4 (3.50%)	114
Oesophagus	3 (2.63%)	114
Major vessels	4 (3.5%)	114
Ribs	77 (67.54%)	114
Sternum	17 (14.91%)	114
Clavicle	13 (11.40%)	114
Thoracic vertebra	6 (5.26%)	114

**Table 4:** Distribution of injury pattern of organs of the thoracic region (n=114)

Organ	Contusion	Laceration	Total	Out of
Right lung	45	25	70 (61.5%)	114
Left lung	28	25	55(48.24%)	114
Heart	10	14	24(21.05%)	114
Bronchus	7	5	12(10.52%)	114
Trachea	1	3	4 (3.5%)	114
oesophagus	0	3	3 (2.63%)	114

**Table 5:** Injury to lung and heart with and without rib fracture

Organ	With rib fracture	Without rib fracture	Total
Lung	76(87.35%)	11(12.64%)	87
Heart	20(83.33%)	4 (17.40%)	24

## DISCUSSION

RTA cause mechanical trauma, resulting in morbidity, disability and even mortality. The fatality rate in road traffic accident in India is the highest in the world and reported to be 20 times more than that reported in developed countries.<sup>4</sup> Table no. 1 shows the male preponderance to the RTA victim was more than female, which is in accordance with the Khajuria *et al* (2008)<sup>5</sup>, Hanumantha *et al* (2012)<sup>4</sup>, M R Lamb *et al* (2012)<sup>6</sup> with the most vulnerable age group is between 21-30 yrs, which is in accordance with R V.KACHRE *et al* (2003)<sup>7</sup>, P murky *et al* (2012)<sup>8</sup>, NB Kumar *et al* (2013)<sup>9</sup> The reason for these types of observations might be that age group 21-30 years and 31-40 years are more active and exposed to exterior world more frequently for education and job that's why they are more prone to hazards of modern automobile world. In present study, maximum no. of victims were died on the spot, which in accordance with the Meera Th. *Et al* (2003)<sup>10</sup>, P murky *et al* (2012)<sup>8</sup>. In the present study more commonly injured organs in thoracic region were lungs 76.31%, which is in consistent with the studies of zavar khichi *et al* (2009) *et al*<sup>11</sup> (52.7%), M R Lamb *et al* (2012)<sup>6</sup> (62%), P murky *et al* (2012)<sup>8</sup> (76%). This could be due to the, larger size, mobility of lungs in chest cavity which could be under acceleration and deceleration impact. In present study the rib fracture was the most common skeletal injury in the thoracic region i.e. 77 cases (68.42%) are in consistent with the Harman singh *et al* (2004)<sup>12</sup> (44%) hanumantha a *et al* (2012)<sup>4</sup> 63.3%, This could be due to ribs are most exposed bone to trauma as they are spread over large area.

## CONCLUSION

During the study it was found that lung is most commonly involved organ in thoracic cavity followed by heart. Injuries found commonly on Right lung than left lung. Number of Male victims was more than female victims. The most vulnerable age group is between 21-30 yrs. It was found that maximum victims are died on the spot.

## RECOMMENDATIONS

The study showed that most RTA deaths, brought to a tertiary care rural hospital, took place either on the spot or within 24 hours of injury which is indeed very alarming. It warrants the urgency to establish good pre-hospital care and provision of efficient and prompt trauma services at site.

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