

Study of Blunt Fatal Injuries in Udaipur Region

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Abstract

This study has been undertaken to determine the pattern blunt injuries, socio-demographic profile of cases and to identify the risk of various body organs in cases reported at Udaipur region.

In this study, by virtue of the inclusion criteria for the cases, a significant number of victims suffered thoraco-abdominal injuries, though they may be only external injuries, with or without associated internal injuries or internal injuries with or without associated external injuries. Among these, not all injuries were fatal in nature.

In the thoracic region, injuries were seen in 80 cases either individually or in association with abdominal injuries. Out of these fatal thoracic injuries were seen in only 16% cases. Among non fatal thoracic injuries, majority of cases had external injuries to the chest wall. External thoracic injuries were seen in only 16% cases. Among non fatal thoracic injuries, majority of cases had external injuries to the chest wall. External thoracic injuries were seen in 72 cases. (In this study abrasions were the most common external thoracic injury in 69% cases; followed by contusions in 13% and lacerations in 07% cases.

Keywords: Trauma, abdomen, blunt, injuries, fatal

Introduction

Since prehistoric times, thoraco -abdominal cavity has been looked upon as one of the most vulnerable region of the body and injuries involving it have always been considered serious. Due to anatomical position and dimension, the thoraco -abdominal region is a major site of impact in any type of trauma.

Thoraco-abdominal injuries provide a major contribution to death because the bony thoracic cage contains vital organs of circulation and respiration and trauma to these organs challenges the integrity and viability of entire human body. Similarly, abdomen is the third commonest region of body that is injured in civilian trauma, as human abdomen is largely unprotected by bony structure²⁷. Injuries to abdomen are important as it contains numerous important vital

organs like liver, spleen, kidney, pancreas and hollow viscous like stomach, intestines and urinary bladder, and injuries to these organs are significant as individually or cumulatively sufficient for morbidity and mortality³.

It is frequently seen that subsequent to blunt force trauma to the thoracic wall may or may not show any injuries but abdominal walls usually escape gross injury by transmitting the force of violence to the more resistant organs inside the abdominal cavity which get injured without any visible external injury in the region⁷. Injuries are overlooked during three phases in patient management: these include (a) initial assessment, (b) diagnostic work-up (imaging, laboratory studies etc.), and (c) surgical exploration. Hence, there is always a possibility of fatal thoraco -abdominal injuries to go unnoticed and leading to their late detection and fatal outcome.

Thoraco-abdominal injuries are of particular interest in medico-legal cases for several reasons. The study of pattern of external and internal injury may all together helps in the determination of actual or probable anatomical site of primary impact which may be useful

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in reconstruction of the events. Thus, a careful study of total injury pattern is of vital importance in every case⁹. In the difficult scenario of assessing the manner of death, meticulous autopsy in combination with visit to the scene of occurrence and presence of any intervening object is of extreme help¹⁸.

This post-mortem study of pattern of thoraco-abdominal injuries, its type pattern and nature of external and internal injuries involved is an attempt to highlight the trends in the region regarding various modes of injuries for this region²¹. The risk stratification in the susceptible population and the study of nature of offending agent can help the authorities in propagating safety measures and better availability of health care.

This study will not only help us to broaden the horizon of the knowledge of clinicians for treatment of trauma victims and medico-legalists to deposit evidence in the court of law but also help us to devise strategies and policies to reduce mortality and morbidity from thoraco-abdominal injuries.

Material and Method

Place of study: Department of Forensic Medicine & Toxicology, R.N.T. Medical College, Udaipur.

Study Design: Hospital based Descriptive Observational Study

Study period: October 2016 to September 2017

Sample Size: At least 100 cases of traumatic deaths satisfying the inclusion and exclusion criteria from amongst the dead bodies received for postmortem examination at the mortuary of RNT Medical College, Udaipur, during the study period.

Study subject: Cases of traumatic deaths brought for medico-legal autopsy to the mortuary of RNT Medical College, Udaipur satisfying the mentioned inclusion and exclusion criteria.

Inclusion Criteria: 1. Treatment records suggestive of blunt thoraco- abdominal Trauma

2. Police inquest suggestive of blunt thoraco-abdominal Trauma

3. Post-mortem findings suggestive of blunt thoraco-abdominal Trauma

Exclusion Criteria

1. Cases of penetrating thoraco- abdominal injuries.
2. Any case of death due to non thoraco -abdominal trauma like burn, asphyxia.
3. Any case of non-traumatic cause as poisoning.

All cases having post-mortem findings of blunt thoraco -abdominal trauma with or without history will be included in the present study.

After the routine medico-legal formalities and inquest procedures, history will be elicited from the relatives and the investigating authorities to fill up all relevant details of the Performa and a meticulous post-mortem examination will be performed as per recommended procedures for each case. All relevant post-mortem findings will be recorded as per the proposed Performa.

Findings

Observations

Table 1: Showing sex wise distribution of 100 cases n=100

Sex	Number	%
Male	88	88
Female	12	12
Total	100	100

Amongst the 100 cases, 88 subjects were male and 12 were female, which is an obvious figure owing to preponderant active participation of males in socio-economic activities.

Table-2: Showing age group wise distribution of 100 cases n=100

Age group (Years)	Total no. of victims	%
0-9	2	2
10-19	4	4
20-29	33	33
30-39	23	23
40-49	18	18
50-59	13	13
>60	07	07
Total	100	100

Out of 100 fatal cases, 33 victims were in the age group of 20-29 years and 23 in 30-39 followed by 18 cases in 40-49 years age group and 13 between 50-59 years of age. A total of 87 cases of fatalities were from the productive age group of 20-59 years. Out of the remaining cases 06 subjects were of less than 20 years and 07 above 60 years of age. The lesser preponderance

of total traumatic fatalities 13 is obvious for these age group on account of their lesser mobility.

The fatalities included in the study population were 65 cases from rural region and 35 cases of urban region

Table-3: Showing distribution of 100 cases according to mode of injury and cause of death n= 100

Mode of injury	Cause of death					Total
	Shock and Haemorrhage	Coma	Septic shock	Traumatic asphyxia	Decapitation	
Road accidents	53	29	2	1	0	85
Fall from height	9	02	00	00	00	11
Train accident	2	00	00	00	00	02
Assault	1	00	00	00	00	01
Machine injury	1	00	00	00	00	01
Total	65	32	02	01	00	100

Maximum (65%) fatalities occurred as a result of haemorrhagic shock, 32% deaths resulted due to head injury. 01 cases where death occurred as a result of traumatic asphyxia and 02 cases septic shock.

Maximum three quarter of fatalities 85 were due to road accident followed by 11 subjects who succumbed of an episode of fall from height further followed by 02 casualties owing to train accidents and only 02 casualties occurred as a result of an episode of assault or machine injury.

Classifying the cases of road accidents according to the victim vehicle, there were 05 (5.88%) pedestrians, 49 (57.64%) two-wheelers and 31 (36.47) four-wheelers. Among the two wheeler riders 30 (35.29%) were riders and 19 (22.35) were pillion riders. Also, there were 26 light motor vehicles with 20 drivers and 06 occupants. There were 05 cases of heavy motor vehicle with all the victims being occupants.

Table 4: Showing distribution of 100 cases according to body region involved in trauma n=100

Body region	Number of cases	%
Thoracic injuries	12	12
Abdominal injuries	19	19
Thoraco-Abdominal injuries	68	68
Others	01	1
Total	100	100

Out of the total 100 cases, there were thoracic injuries in 12 cases, abdominal injuries in 19 cases and thoraco-abdominal injuries in 68 cases. 01 case were included in the study on the basis of the information in

the police requisition and treatment records; however on post mortem examination, there was no thoraco-abdominal injury in these cases. These 1% cases were of injuries to other body parts but were included in the study as they satisfied the inclusion and exclusion criteria.

Thoracic injuries were seen in 80 cases; out of which there were 72 cases of external injuries having 68 associated internal injuries. There were 08 cases of internal thoracic injuries without associated external injuries. In 68 cases of external as well as internal thoracic trauma, thoracic trauma remained uninvestigated.

Out of the cases of thoracic injuries, in 72 cases, there was visible external trauma; however, investigations for evaluation of that trauma were performed in only 09 cases. A highly significant number of cases with external thoracic injury remained unevaluated as regards to the type and severity of the injury and in 63 cases, out of the total 79 cases in which external injuries were present but investigation were not performed; the external injuries were associated with visceral thoracic injuries.

Table 5: Showing distribution of 72 cases of external thoracic injury according to type of injuries

n=72

Type of injury	Chest	
	No. of cases	%
Abrasion	50	69.44
Bruise	09	12.50
Laceration	05	6.94
Swelling / Deformity	08	11.11
Total	72	100

Out of the 72 cases with external thoracic injuries, in 50 cases the type of injury was abrasion, bruises in 09 cases, laceration in 05 cases and 08 cases with swelling &/ or deformity of the thoracic wall.

Out of 72 cases of thoracic injuries which showed external signs of trauma, there was fracture of thoracic cage bones in 68 cases and remaining 4 cases were non-bony involvement.

Table 6: Showing pattern of bony injury in 68 cases of fracture of thoracic cage n=68

Bone fractured in thoracic cage	No. of cases	%
Ribs	32	47.05
Sternum	08	11.76
Clavicle	12	17.64
Vertebrae	01	1.47
Sternum+ Clavicle	02	2.94
Sternum+ Ribs	04	5.89
Ribs+ Clavicle	05	7.35
Ribs+ Sternum+ Clavicle	04	5.89
Total	68	100

Out of 72 cases of thoracic injury, there was fracture of thoracic cage bones in 68 cases, with multiple type of bony involvement in 15 of the cases. The fracture of ribs was the commonest injury in the thoracic region and ribs remained the most common bone of thorax to be fractured followed by clavicle, sternum and thoracic vertebrae.

Out of the total 72 cases of thoracic injuries, there were associated fractures of the thoracic cage in 68 amongst which in 53 cases, only one type of bone was fractured and in rest of 15 cases, more than one type of bone were fractured.

Conclusions

This study revealed that out of the 100 fatal cases of thoraco-abdominal trauma, 16.0% cases had not succumbed as a result of thoraco-abdominal injuries. In these cases, the death had resulted as a consequence to head injury, pelvic injury and injuries to extremities. In rest of the 84% cases, the death had resulted following either thoracic or abdominal or both injuries. Amongst them in 19% cases death resulted from abdominal trauma in 12% cases there was fatal thoracic trauma and in 68% cases both thoraco-abdominal injuries were responsible for the mortality. The injuries in thoraco-abdominal region were thus of fatal and non fatal categories and

a total of 99 cases suffered fatal thoraco-abdominal trauma and rest had suffered non-fatal injuries to the thoraco-abdominal injuries.

From the present study we summarize that:

Majority of the victims were males (88%)

Youngsters in the age group of 20-29 years (33%) were most commonly involved age group. Majority of the victims were of the most productive and active phases of life ranging from 20-49 years (74%).

Majority of the victims had succumbed to accidental traumatic episodes. Road traffic accidents were the major cause of fatality due to blunt thoraco-abdominal trauma (85%).

Among vehicular accident victims, most common population was of two-wheeler rider (57.67%) followed by the four – wheeler (36.47%).

80% victims suffered thoracic injuries out of which fatal injuries were seen in only 16% cases. External injury was more common than internal injury in the thoracic region.

Fracture of thoracic cage was the most common thoracic injury (68%) with fractured ribs in 66% of these cases. Lungs were the most commonly involved organ in visceral injury.

Abdominal injury was found in 87% victims however external injuries were seen in 53% cases. Thus, internal injuries were more common in abdominal region and were also seen without associated external injuries.

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Conflict of Interest : Nil

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