

Pattern Of Blunt Thoraco Abdominal Injuries In Fatal Medico-Legal Cases In Jodhpur Region

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ABSTRACT:

Background: This post-mortem study of patterns of thoraco-abdominal injuries, its type-pattern and nature of external and internal injuries involved is an attempt to highlight the trends regarding various modes of injuries for this region. **Aims & Objectives:** To determine the pattern of blunt thoraco-abdominal injuries in fatal medico-legal cases. **Material & Methods:** The Hospital based descriptive Observational Study, included 100 cases of traumatic deaths satisfying the inclusion and exclusion criteria from the dead bodies received for post-mortem examination at the mortuary of Dr. S. N. Medical College, Jodhpur. **Results:** The present study showed the 30 victims were in the age group of 20-29 years and Maximum (87%) fatalities occurred as a result of hemorrhagic shock. **Conclusion:** The commonest cause of death in this study was hemorrhagic shock attributed to internal bleeding from injuries to thoraco-abdominal organs. These are some of the factors apart from injury severity scoring, which affect the period of survival.

Key Words: Thoraco-abdominal injuries, External injuries, Internal injuries.

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INTRODUCTION:

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 structure. 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 mortality¹.

It is frequently seen that subsequent to blunt force trauma, 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 region. Abdominal injuries can be overlooked during three phases in

patient management: (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 and thoraco-abdominal injuries are of particular interest in medico-legal cases. 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 in reconstruction of the events. Also, a missed injury, which is not only a harbinger of serious morbidity and mortality, but also a source of professional embarrassment and possible litigation, can be avoided. Thus, a careful study of total injury pattern is of vital importance in every case. 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 help². 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 regarding various modes of injuries for this region. 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 & METHODS:

The hospital based descriptive observational study, included 100 cases of traumatic deaths satisfying the inclusion and exclusion criteria from amongst the dead bodies received for post-mortem examination at the mortuary of Dr. S. N. Medical College, Jodhpur and associated group of Hospitals, during the study period (April 2015 to November 2015). Before doing this study permission was taken from ethical committee of institution.

Inclusion Criteria

1. All the cases in which treatment records, police inquest papers and post-mortem findings were 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, etc.
3. Any case of non-traumatic cause such as poisoning.

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

All relevant post-mortem findings were recorded as per the proposed Performa.

RESULTS:

The present study showed that the 30 victims were in the age group of 20-29 years and only 10 cases were above 60 years of age (Table-1). Maximum (87%) fatalities occurred as a result of hemorrhagic shock. (Table-2). Thoracic injuries were seen in 79 cases; out of which there were 75 cases of external injuries were having 55 associated internal injuries also (Table-3) and total numbers of cases suffering abdominal injuries, external as well as internal were 80 of all cases (Table-4). The present study shows that the liver injury was present in 45 cases followed by splenic injury. The cases of injury to stomach and urinary bladder were relatively less as compared to others (Table-5).

Injury severity score (ISS) in the present study ranged from 1 to 75. The relationship between ISS and survival period showed that higher the ISS value, lower is the survival period and vice versa (Table-6).

DISCUSSION:

In the present study, it was observed that the maximum numbers of victims were in the age group of 20-39 years. This is quite explainable as the subjects in the age group of 20-49 years lead more active life and are at the peak of creativity having the tendency to take risks, there by subjecting themselves to the dangers of traumatic episodes. Similar

findings have been reported by Chandulal,³ Chandra et al,⁴ Bergvist et al,⁵ Sharma,⁶ Sathiyasekaran,⁷ Croce et al,⁸ Boulanger,⁹ Odelowo,¹⁰ and Sharma et al.¹¹ The majority of the victims were in the age group ranging from 20-49 years (65%) of age group amongst whom majority of the cases were in the age group of 20-29 years (30%) followed by the age group of 30-39 years (20.0%). Our findings are in accordance with the findings of other workers Chandulal,³ Chand and Dogra,¹² Banerjee et al,¹³ Jha et al,¹⁴ Kaul et al,¹⁵ Meera et al,¹⁶ and Shetty et al.¹⁷

The commonest cause of death was hemorrhagic shock as a result of intra-thoracic and abdominal bleeding in 87% cases followed by deaths as a result of head injury in 11% cases. There was a single case of death due traumatic asphyxia followed by land slide, decapitation due to train accident and peritonitis. In 19 cases the death resulted following abdominal trauma and in 20 cases the fatality resulted from thoracic trauma. In 60 cases both thoraco-abdominal injuries remained the offending cause of fatality. Our findings are similar to those of Brainard et al¹⁸ and Meera et al.¹⁶ External injuries to the abdomen was seen in 50 cases (50%) out of all, however the total number of cases suffering abdominal injuries, external as well as internal were 80(80%) of all cases. This is quite explainable by the anatomical morphology of abdomen which is a pliable structure, thus vulnerable to sustaining injuries to internal organs even with no external sign of injury evident. The abdominal wall usually

escapes gross injury to the wall by transmitting the force of violence to more resistant organs inside the abdominal cavity. Similar results have been reported by Meera et al.¹⁶ and Shetty et al.¹⁷ In our study, in this part of the body too, abrasions were the commonest injury, observed in 64% cases while only 16% cases showed lacerations of abdominal wall. Our findings are in disagreement with those of Shetty et al.,¹⁷ who reported contusions as the most common external injury over the abdomen. Internal injuries of abdomen were observed in 72.0% of total fatalities which was 90% of all abdominal injuries. The most commonly involved organ was liver, being involved in 45.00% followed by spleen in 30.0% cases and kidneys in 12.0% cases. These findings are quite explainable and obvious as depicted by the anatomical location and size of liver and spleen making them vulnerable to injuries in cases of hit to the abdominal region. Kidneys being a retro-peritoneal structure are saved from the consequences of direct impact. Almost similar findings were reported by Chandulal,³ Chandra et al.,^{4&12} Bergvist et al.,⁵ Sharma,⁶ Arajarv et al.,¹⁹ Sharma,²⁰ Kaul et al.¹⁵ and Meera et al.¹⁶ But our findings are in contrast to those of Shetty¹⁷ who reported kidney to be the most commonly involved solid organ. Our study reports involvement of the abdominal organs as liver, spleen, kidney and urinary bladder in descending order of frequency which is quite similar to that by Chandulal³ who reported them to be as liver, spleen, bladder and kidney in descending order.

In this study 15% victims died on the spot followed by the victims (45%) who died within 6 hours of the incidence, which is similar to the observations of Sharam et al.¹¹ and Pathak et al.²¹ However, our figures are significantly lower than that reported by Meera et al.¹⁶ The higher figures for early mortality may be due to the severity of injuries or to inadequate infrastructure for early transport and management of trauma patient and higher involvement of road accident fatalities. Injury severity score (ISS) in the present study ranged from 0 to 75. ISS was found to be of paramount importance in multiple injury cases following road accidents. The relationship between ISS and survival period showed that higher the ISS value, lower is the survival period and vice versa.

CONCLUSION:

The commonest cause of death in this study was hemorrhagic shock attributed to internal bleeding from injuries to thoraco-abdominal organs. Prompt transportation with facilities for adequate pre-hospital care should be routinely provided at various places for immediate care, stabilization and timely shifting of trauma victims to a well-equipped trauma care centre. These are some of the factors apart from injury severity scoring which affect the period of survival.

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Table 1: Age group wise distribution of cases

Age group (In yrs)	Total no. of victims	Percentage
0-9	03	3.00 %
10-19	11	11.00 %
20-29	30	30.00 %
30-39	20	20.00 %
40-49	15	15.00 %
50-59	11	11.00 %
>60	10	10.00 %
Total	100	100.00 %

Table 2: Distribution of cases, according to mode of injury & cause of death

Mode of Injury	Cause of death					Total
	Shock & Hemorrhage	Coma	Peritonitis	Traumatic Asphyxia	Decapitation	
Road accidents	66	08	00	01	00	75
Fall	10	02	00	00	00	12
Train accident	07	01	00	00	00	08
Assault	02	00	01	00	00	03
Land slide	01	00	00	00	00	01
Machine Injury	01	00	00	00	00	01
Total	87	11	01	0	1	100

Table 3: Distribution of cases, according to external and visceral thoracic injuries and the investigation status

Investigation	External Injury Present			External Injury Absent		
	Visceral injury of chest			Visceral injury of chest		
	Present	Absent	Total	Present	Absent	Total
Not Performed	46	13	59	02	11	13
Performed	09	07	16	02	10	12
Total	55	20	75	04	21	25

Table 4: Distribution of cases, according to external Injury & visceral injury to abdomen and their Investigation Status

Investigation	External Injury Present			External Injury Absent		
	visceral injury to abdomen			visceral injury to abdomen		
	Present	Absent	Total	Present	Absent	Total
Not Performed	34	4	38	24	10	34
Performed	8	4	12	06	10	16
Total	42	8	50	30	20	50

Table 5: Distribution of abdominal visceral involvement in cases of thoraco-abdominal trauma

Viscera involved	No. of cases	Percentage
Liver	45	45.00%
Spleen	30	30.00%
Kidney	12	12.00%
Intestine	11	11.00%
Stomach	1	1.00%
Urinary Bladder	1	1.00%

Table 6: Relation between survival period and injury severity score (ISS)

Survival Time	Injury Severity Score (ISS)						Total
	1-10	11-20	21-30	31-40	41-50	51+	
Brought Dead / < 1 hrs	0	1	1	4	6	3	15
1 - 6 hrs	2	5	14	5	13	6	45
6 - 12 hrs	1	1	2	1	2	1	8
12 – 24 hrs		1	2	1	1		5
1-3 days	3	2	2	1			8
3-7 days	1	2	1	2	1		7
> 7 days	4	2	3	2	1		12
Total	11	14	25	16	24	10	100