

Pattern of Thoraco-abdominal Injuries in Rural Region

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Abstract: The study entitled pattern of thoraco-abdominal injuries in rural region was carried out at rural medical college, Loni, was done over a period of two and half years from January 2005 to June 2007, and consists of 173 cases of thoraco-abdominal injuries, out of which 118 were admitted to Pravara Rural Hospital for treatment and 55 were brought dead to the hospital. Out of 118 admitted cases of thoraco-abdominal injuries to hospital 80 were treated and discharged and remaining 38 died during the treatment, thus out of 173 cases of thoraco-abdominal injuries 93 were autopsied and 80 treated and discharged. Present study revealed that 82.6% of victims were males and mostly in age group of 21 - 40 years i.e. 53.75% among both fatal and non-fatal groups. Accidental occurrence of thoraco-abdominal injuries was commonest followed by homicidal and suicidal. Among accidental occurrences road traffic accidents was the commonest cause for thoraco-abdominal injuries (84.9%), study also revealed that a majority of victims of thoraco-abdominal injuries i.e. 32.25% died on the spot, 23.64% died within 12 hours of sustaining injuries, 6.45% of victims survived for 1 to 7 days and only 3.22% were survived for more than a week after sustaining a injuries. Pattern of thoraco-abdominal injuries shows that the commonest injury of thoracic region was fracture of ribs among both fatal and non-fatal categories and most commonly affected thoracic organs were lungs (32.31%) and injuries to heart comprises for only 4.04%. Among abdominal injuries the most commonly affected organ was liver (20.23%) followed by spleen (16.18%) and kidneys (12.71%) and among hollow viscus injury to intestine was more frequent i.e. 7.51% followed by injuries to urinary bladder 6.93% and stomach 2.89%.

Key words: thoraco-abdominal, manner, pattern, injury.

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 very serious⁽¹⁾. Due to its anatomical position and dimension the thoraco-abdominal region is a major site of impact in any form of blunt trauma⁽²⁾.

Thoraco-abdominal injuries are caused by a wide variety of reasons like road traffic accidents, railway accidents, industrial mishap, penetrating trauma, blunt trauma, and growing menace of terrorism globally

involving bomb explosion injuries and iatrogenic or therapeutic injuries.

The bony thoracic cage contains vital organs of circulation and respiration and trauma to these organs challenges the integrity and viability of entire organism, similarly abdomen is the third commonest region of the body that is injured in civilian trauma, as human abdomen is largely unprotected by bony structure⁽³⁾. Injuries to abdomen are important as it contains numerous vital organs like liver, spleen, kidney, pancreas and hollow viscous like stomach, intestines and urinary bladder, and injuries to these organs are significant as isolated injuries to liver, spleen and intestine can be saved if timely surgical aid is provided to them⁽⁴⁾.

In present study the thoraco-abdominal injuries were evaluated according to age, sex, manner of injury, pattern of injury and period

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of survival after sustaining injury. This kind of knowledge will play a significant role in future planning to reduce morbidity and mortality and also to develop preventive strategies against thoraco-abdominal injuries.

Material and Methods

It is a retrospective and prospective study carried out in the department of forensic medicine of rural medical college of pravara institute of medical sciences (deemed university) loni.

The data for study was collected over a period of two and half years i.e. From january 2005 to june 2007. Data was analyzed retrospectively from january 2005 to june 2005 where as data from july 2005 to june 2007 i.e. Over a period of two years prospectively analyzed, thus over all duration was of two and half years.

Present study consists of 173 cases of thoraco-abdominal injuries out of which 118 were admitted to hospital and 55 were brought dead to hospital.

Out of 118 cases of thoraco-abdominal injuries admitted to hospital for treatment 80 cases were treated and discharged and 38 cases died during treatment.

So study comprises 93 medico-legal post-mortem cases and 80 treated in-patient cases. For retrospective analysis of cases, the entire medico-legal records includes injury report, treatment and investigation reports in admitted and discharge cases and autopsy report, inquest report in post-mortem cases were utilized. For prospective study detailed information perused on various epidemiological and medico-legal aspect which were required for study obtained by discussion with patients when they were alive and admitted to hospital for treatment and by discussion of individual case with investigating officer, relatives and friends of deceased in fatal cases.

Results

The main emphasis in the present study was on thoraco-abdominal injuries. During the study period total number of patients admitted to pravara rural hospital were 45,296 out of which 173 cases were of thoraco-

abdominal injuries, thus the prevalence of thoraco-abdominal injury was 0.38 % at this institute. Amongst 173 cases of thoraco-abdominal injuries 93 were fatal on whom medico-legal autopsies were carried out in the department of forensic medicine and remaining 80 cases were discharge after treatment from hospital.

The present study reveals that maximum numbers of victims of thoraco-abdominal injuries were males (82.6 %) as compared to females (17.34 %) in both fatal and non fatal categories and maximum number of victims in both fatal and non fatal categories belonged to age group 21-30 years followed by 31-40 years (table no. 1).

The commonest manner of thoraco-abdominal injuries was accidental (96.53%) in both fatal and non fatal categories followed by homicidal (2.31 %) and suicidal (1.15 %). Amongst accidental occurrence road traffic accidents was the commonest cause for thoraco-abdominal injuries (84.9 %) (table no. 2).

The study also shows that 45.08 % of victims in both fatal and non fatal categories had injuries to thoracic region, followed by injuries to thoraco-abdominal region (23.21%) while the injuries to abdominal region comprised only 17.20 % cases (table no. 3).

Study also reveals that commonest injury of thoracic region was fracture of ribs (67.73 %) among both fatal and non fatal groups followed by injuries to lung (32.31 %) and injuries to heart comprises only 4.04 %. Among abdominal injuries the most commonly affected abdominal organ was liver (20.23 %) followed by spleen (16.18 %) and kidneys (12.71 %) and among hollow viscus injuries to intestine were most frequent (7.51 %) followed by injuries to urinary bladder (6.93 %) and stomach (2.89 %) (table no. 4).

Amongst the fatal cases of thoraco-abdominal injuries maximum number of victims either died on the spot or before reaching the hospital (59.13 %) and only 3.22 % of the victims survived for more than a week after sustaining the injuries (table no. 5).

Table No. 1: Age and sex wise distribution of cases

Age Group	No. of Cases of Thoraco-abdominal Injuries				Total
	Males		Females		
	Fatal	Non- Fatal	Fatal	Non- Fatal	
0-10	01(0.57%)	01(0.57%)	01(0.57%)	02(1.15%)	05(2.89%)
11-20	09(5.20%)	11(6.35%)	00	02(1.15%)	22(12.71%)
21-30	29(16.76%)	18(10.40%)	02(1.15%)	02(1.15%)	51(29.72%)
31-40	17(9.82%)	14(8.09%)	04(2.31%)	07(4.05%)	42(24.27%)
41-50	10(5.78%)	10(5.78%)	01(0.57%)	04(2.31%)	25(14.45%)
51-60	10(5.78%)	03(1.73%)	02(1.15%)	01(0.57%)	16(9.24%)
61-70	05(2.89%)	03(1.73%)	02(1.15%)	00	10(5.78%)
71 & above	00	02(1.15%)	00	00	02(1.15%)
Total	81(46.82%)	62(35.83%)	12(6.93%)	18(10.40%)	173(100%)

Table no. 2: Manner of thoraco-abdominal injuries

Manner of thoraco abdominal injuries	Fatal	Non-fatal	Total
Accidents	92 (53.17%)	75 (43.35%)	167 (96.53%)
Road traffic accidents	83 (47.94%)	64 (36.99%)	
Fall from height	1 (00.57%)	5 (2.89%)	
Agricultural accidents	2 (1.15%)	2 (1.15%)	
Domestic accidents.	3 (1.73%)	4 (2.31%)	
Railway accidents	1 (00.57%)	--	
Industrial accidents	1 (00.57%)	--	
Other	1 (00.57%)	--	
Homicide	00	04 (2.31%)	04 (2.31%)
Suicide	01 (00.57%)	01(00.57%)	02 (1.15%)

Table No. 3. Distribution of injuries in relation to region involved

Region	Number of cases		Total
	Fatal	Non fatal	
Thorax only	36 (20.80%)	42 (24.27%)	78 (45.08%)
Abdomen only	13 (07.51%)	24 (13.87%)	37 (21.38%)
Both Thoracic and abdominal	32 (18.49%)	08 (04.62%)	40 (23.12%)
Thoracic and fracture of pelvis	05 (02.89%)	03 (01.73%)	08 (04.62%)
Abdomen and fracture of pelvis	03 (01.73%)	02 (01.15%)	05 (02.89%)
Combined thoraco abdominal and fracture of pelvis	04 (02.31%)	01 (00.57%)	05 (02.89%)

Table No. 4. Pattern of Thoraco-abdominal injuries

Injures	Number of cases		Total
	Fatal	Non fatal	
Fracture of ribs	66 (38.15%)	51 (29.47%)	117 (67.63%)
Lungs	42 (24.27%)	14 (08.09%)	56 (32.31%)
Heart	07 (04.04 %)	00	07 (4.04%)
Sternum	09 (5.20%)	00	09 (5.20%)
Others	13 (7.51 %)	09 (5.20%)	22 (12.71%)
Walls	03 (01.73 %)	03 (01.73 %)	06 (3.46%)
Liver	28 (16.18 %)	07 (04.04 %)	35 (20.23%)
Spleen	15 (8.67 %)	13 (7.51 %)	28 (16.18%)
Kidney	14 (8.09 %)	08 (04.62 %)	22 (12.71%)
Stomach	04 (02.31 %)	01 (00.57 %)	05 (2.89%)
Intestine	08 (04.62 %)	05 (02.89 %)	13 (7.51%)
Bladder	12 (06.93 %)	00	12 (6.93%)

Table no. 5: Period of survival and region wise distribution of fatal thoraco-abdominal injuries

Region wise distribution of injuries							Total No. (%)
Survival period	Thorax only No. (%)	Abdomen only No. (%)	Thorax+abdomen No. (%)	Thorax+ fracture pelvis No. (%)	Abdomen+fracture pelvis No. (%)	Thorax+abdomen+fracture re pelvis No. (%)	
Spot death	09 (9.67%)	06 (6.45%)	35 (37.63%)	00	00	05 (5.37%)	55 (59.13%)
Within 1hr	03 (3.22%)	02 (2.15%)	01 (1.07%)	01 (1.07%)	00	00	07 (7.52%)
1 – 2 hrs	01 (1.07%)	02 (2.15%)	03 (3.22%)	01 (1.07%)	01 (1.07%)	01 (1.07%)	09 (9.67%)
3 – 6 hrs	03 (3.22%)	01 (1.07%)	02 (2.15%)	02 (2.15%)	00	00	08 (8.60%)
7 – 12 hrs	02 (2.15%)	02 (2.15%)	01 (1.07%)	00	00	00	05 (5.37%)
1 -7 days	03 (3.22%)	02 (2.15%)	01 (1.07%)	00	00	00	06 (6.45%)
>1 week	02 (2.15%)	01 (1.07%)	00	00	00	00	03 (3.22%)
Total	23 (24.71%)	16 (17.20%)	43 (46.23%)	04 (4.30%)	01 (1.07%)	06 (6.45%)	93 (100%)

Discussion

Maximum numbers of the victims in the present study were males (82.6 %) in the age group of 21-40 years (53.75%) both in terms of morbidity and mortality. The fact that males are usually the earning members of the families makes them more vulnerable to the accidents, industrial mishaps as compared to females who are mostly indulged in household chores. The subjects in the age group of 21-40 years lead more active life and

are at the peak of their creativity having the tendency to take risk, thereby subjecting themselves to the dangers of accidents and injuries. Kumar Adarsh et al⁽⁵⁾ reported that number of cases and mortality was maximum in the age group of 21-30 years followed by 31-40 years. Similar findings were also reported by Meera Th et al⁽²⁾ and Banerjee et al⁽⁶⁾.

The commonest manner of thoraco-abdominal injuries amongst the victims in

both fatal and non fatal categories was accidental (96.53 %) as compared to homicidal (2.13 %) and suicidal (1.15 %) occurrence. This may be due to the fact that the thoraco-abdominal region's location and its anatomical position makes it vulnerable to impact in any form of blunt trauma e.g. RTA, fall from height, and land slides etc. Amongst accident commonest cause was road traffic accident (84.9 %) which may be due to the reason that the rural area of pravara is in the vicinity of highways connecting important cities like Bumbai and Nasik to pilgrim spots Shirdi and Shanishignapur. Maximum pilgrims from different parts of India also travel to these shrines by road. Similar findings are also reported by Meera Th et al⁽²⁾ and Kumar Adarsh et al⁽⁵⁾ that majority of blunt thoraco-abdominal injuries were due to RTA.

Study also reveals that significant number of victims (45.08%) had only thoracic injuries followed by combined thoraco-abdominal injuries (23.12%) and only 21.38% of the victims had abdominal injuries. Similar findings were reported by Tirpude et al⁽⁷⁾ and Pathak et al⁽⁸⁾.

The commonest injury of thoracic region was fracture of the ribs (67.63%) and amongst the thoracic organs lungs were the most commonly affected thoracic organ (32.31%) followed by heart (4.04%). This may be due to fact that fracture of the ribs (and skull) are of frequent occurrence⁽⁹⁾. Lungs are most commonly affected as they occupy most of the space of the thoracic-cage making them more vulnerable to injury by trauma as compared to the other organs. The findings of the present study are in tandem with other studies carried out previously by Bansal et al⁽¹⁰⁾, Lalwani et al⁽¹¹⁾ and N. Ali and B.M. Gali⁽¹²⁾.

Present study also shows that among abdominal injuries most commonly affected solid abdominal organ was liver (20.23%) followed by spleen (16.18%) and 12.71% of victims had injuries to kidney. This may be due to fact that liver because of its large size extending from fourth intercostals space

down to iliac crest⁽¹³⁾ and placed more anteriorly as compared to other solid abdominal organs. Similar findings were reported by Devi Th Meera⁽¹⁴⁾, Banerjee et al⁽⁶⁾ and Ghangle et al⁽¹⁵⁾. Among injuries hollow viscus of abdomen, and intestinal perforation was commonest (7.51%), followed by the perforation of urinary bladder (6.93%) as bladder is protected by the pelvic brim.

Amongst the fatal cases of thoraco-abdominal injuries maximum number of victims either died on the spot or before reaching the hospital (59.13 %) and only 3.22 % of the victims survived for more than a week after sustaining the injuries (table no. 5). The well known explanation could be that most of major vital organs of the body are located in these two cavities and injuries to these organs causes severe blood loss leading to hemorrhagic shock which is the mode of death in these cases.

Conclusion

The 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.

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