

Retrospective Statistical Study of Thoracic Trauma Patients in Al-Hussein Hospital, Al-Azhar University

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ABSTRACT

Background: Trauma is reported to be the leading cause of death. Thoracic trauma comprises 10-15% of all traumas. Thoracic trauma directly accounts for approximately 25% of trauma related mortality and is a contributing factor in another 25%. Eastern Mediterranean region had one of the highest rates of trauma mortalities around the world. **Objective:** to determine chest trauma cases as regards the pattern, etiology, type of chest trauma, management and outcome of chest trauma in Al-Hussein Hospital, Al-Azhar University.

Patients and methods: A retrospective study was done on one hundred patients with traumatic chest injuries admitted to Al-Hussein Hospital, Al-Azhar University and were randomly chosen. Data were collected from patient's files.

Results: The highest incidence of thoracic trauma was found in age groups of 3rd and 4th fourth decades. The cause of trauma was work related; 42%, assault; 31%, road traffic accident; 20% respectively. Forty seven percent of cases had open cardiothoracic injury, 26% had closed lung injury and hemothorax, and 18% had chest cage fracture while 9% had pneumothorax only. **Conclusion:** Assault related injury was found to be the commonest cause of chest trauma followed by road and motor car accident, which could be explained by characters of population activities in the area surrounding Al-Hussein hospital.

Keywords: Al-Hussein Hospital, Thoracic trauma.

INTRODUCTION

Trauma continues to be a major health problem worldwide because it is associated with high morbidity and mortality in both developed and developing countries. It is the leading cause of death, hospitalization, and long-term disabilities in the first four decades of life. Thoracic trauma comprises 10-15% of all traumas ⁽¹⁾.

O'Connor and Adamski ⁽²⁾, reported that thoracic trauma directly accounts for approximately 25% of trauma related mortality and is a contributing factor in another 25%. Fortunately, over 80% of injuries can be managed utilizing tube thoracostomy, appropriate analgesia and aggressive respiratory therapy.

The etiological pattern of chest trauma varies worldwide with many environmental and sociopolitical factors. Road traffic accidents (RTAs) remain the cause of most chest trauma in non-war zones. Mohta *et al.*, ⁽³⁾ stated that very few studies have been conducted to assess its magnitude and management of thoracic trauma.

Pekka and Knight ⁽⁴⁾, found that injuries can be inflicted on any part of the body. In forensic practice certain areas are particularly vulnerable or have special medicolegal significance, of these are especially the chest in which damage can be sustained to either the chest wall or to the contents.

This study aimed to study chest trauma cases as regards the pattern, etiology, type of chest trauma, management and outcome of chest trauma.

PATIENTS AND METHODS

Our study included cases who were hospitalized due to non-iatrogenic chest injuries and who were randomly chosen. The hospitalization criteria were intrathoracic injury, clinically significant rib cage injury (even one rib fracture), or clinical suspicion of significant thoracic injury like subcutaneous emphysema.

This study was based on analysis of data in medical files of 100 cases in Cardiothoracic Department in Al-Hussein Hospital, Al-Azhar University. Both, epidemiological and medicolegal analysis of the collected data from the studied group were done. Data were patients demographic profile, age, gender, cause of trauma, various chest and other associated injuries, underlying co-morbidities, interventional procedures undertaken, length of hospital stay, duration of tube thoracostomy, duration of ventilator support, length of hospital stay, complications, mortality and follow-up.

Ethical approval:

Approval of the study was obtained from Al-Azhar University Academic Ethical Committee based on analysis of data from medical files of patients.

Statistical analysis: The collected data were statistically studied, tabulated and analyzed and graphically represented. The data were analyzed through SPSS for Windows version 10. Nominal variables were reported as frequency and percentages and were compared by Chi² test. P value less than 0.05 was considered significant.



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RESULTS

Age distribution: As shown in figure (1), the highest incidence of chest trauma was found in 3rd and 4th decades (62: % of cases).

Cause of trauma: Table (1) shows the causes of trauma. According to age and cause of trauma, 43.5 % of the younger group had assault related injury, while 39.5% were of the older group. 37.1% of the younger group were injured by road and motor car accident but 21% were of older group.

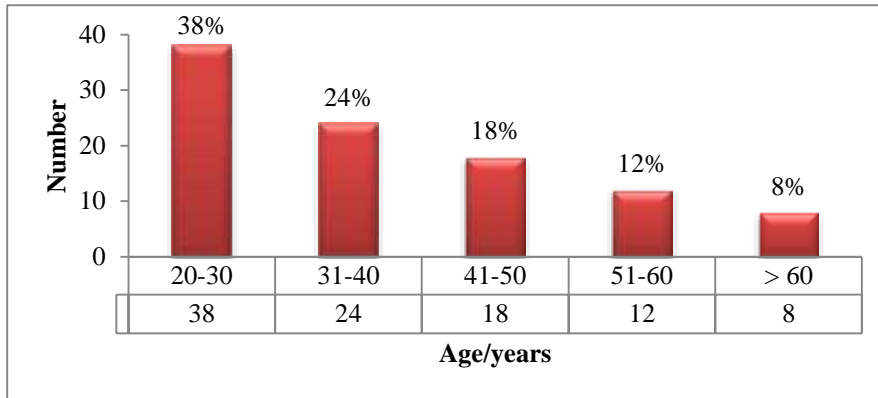


Figure (1): Distribution of studied group according to age

Table (1): Distribution according to the cause of the trauma

Cause of the trauma	≤ 40 years (62)		> 40 years (38)		Total	
	N	%	N	%	N	%
Assault/Violence	27	43.5%	15	39.5%	42	42%
Road and motor car traffic accident	23	37.1%	8	21.0%	31	31%
Work related	9	14.5%	11	28.9%	20	20%
Others	3	4.9%	4	10.6%	7	7%
Total	62	100%	38	100%	100	100%
	X^2		5.59			
	P-value		0.133			

Types of lesions are shown in figure (2).

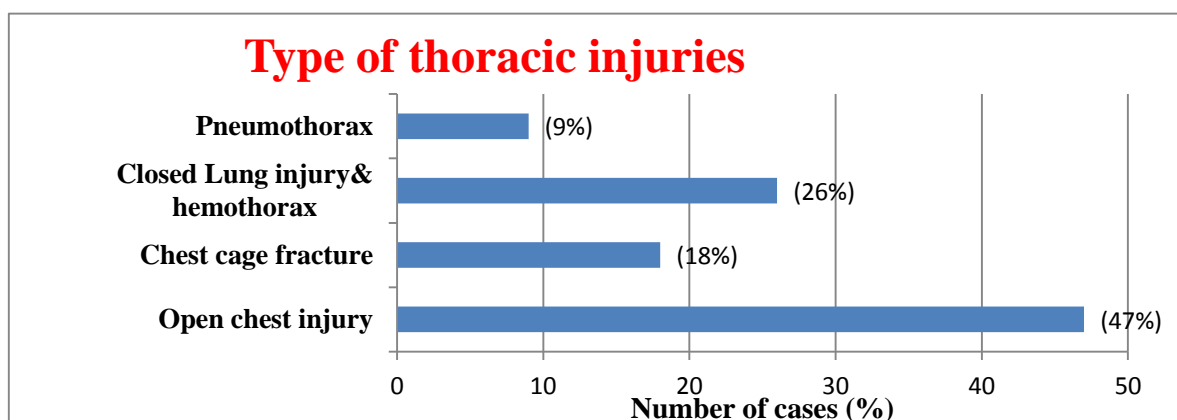


Figure (2): distribution of studied group according to their type of lesion

Figure (3) shows that the predominate associated lesion was skull injury.

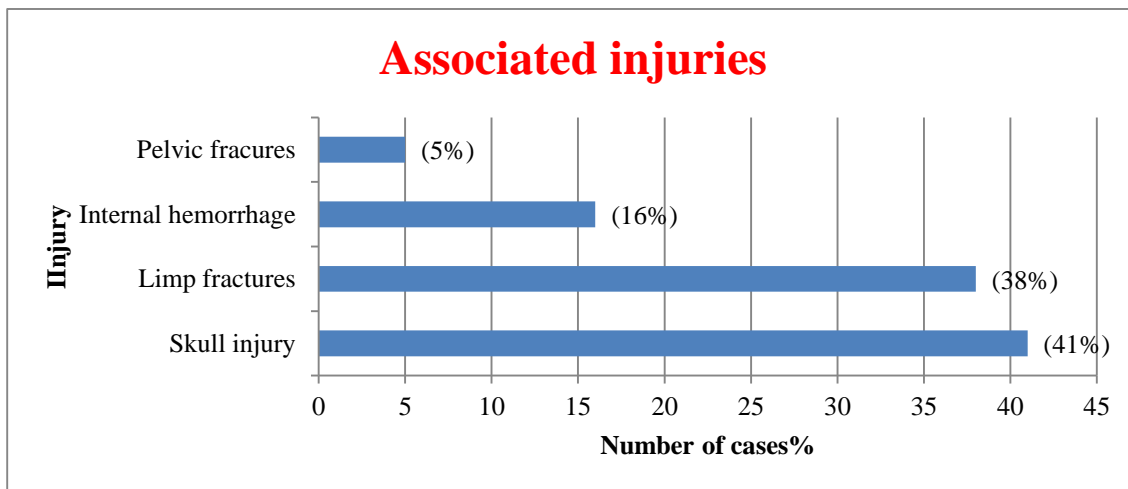


Figure (3): shows associated lesions.

Management and intervention:

Management was surgical in 58% as shown in table (2).

Table (2): management and intervention of thoracic injury cases

Management & Intervention	Less than 40 years (62)		More Than 40 Years (38)		Total	
	N	%	N	%	N	%
Conservative	18	29.0%	7	18.4%	25	25%
Surgical	35	56.5%	23	60.5%	58	58%
Chest tube	9	14.5%	8	21.1%	17	17%
Total	62	100%	38	100%	00	100%
	X^2		1.72			
	P -value		0.42			

Course after admission: Table (3) shows distribution of studied group according to course after admission.

Table (3): shows distribution of studied group according to course after admission

Course after admission.	Less than 40 years (62)		more than 40 years (38)		total	
	N	%	N	%	N	%
Cure	24	38.7%	6	15.8%	30	30%
Complicated	26	41.9%	26	68.4%	52	52%
died	12	19.4%	6	15.8%	18	18%
Total	62	100%	38	100%	100	100%
	X^2		7.47			
	P -value		0.023*			

* Significant

Table (4): distribution according to cause of death

Cause of death.	Less than 40 years (12)		More Than 40 Years (6)		Total (18)	
	N	%	N	%	N	%
Cardiac arrest	6	50%	2	33.33%	8	44.4%
Respiratory failur	4	33.3%	2	33.33%	6	33.3%
Infection	2	16.7%	2	33.34%	4	22.3%
Total	12	100%	6	100%	18	100%
	X^2		0.75			
	P -value		0.69			

Cause of death: Table (4) shows that the main cause of death from thoracic injuries was cardiac arrest.

DISCUSSION

Chest trauma is an important public health problem accounting for a substantial proportion of all trauma admissions and deaths. It directly account for 20-25 % of deaths due to trauma⁽⁵⁾. Globally, 10% of all trauma admissions result from chest injuries and 25% of trauma-related deaths are attributable to chest injuries⁽⁶⁾.

Our study showed that the age with higher incidence of chest trauma was in 3rd and 4th decades, which is consistent with the study of **Saeed et al.**,⁽⁸⁾ who stated that The most affected age group was those in the third decade of life 36% followed by teen agers 28% . Also, **Hanafi et al.**,⁽⁹⁾ from the Middle East region reported that the largest age group was 12–60-years old (79%) and **Saaqi and Shah**⁽¹⁰⁾, who stated that most of the patients belonged to the age group of 21-50 years. In contrast with the study of **Kumar et al.**,⁽⁷⁾ who reported that the maximum number of patients belonged to the age group 41 to 60 years (66%) and the most affected age group was those in the third decade of life (36%) followed by teenagers 28%.

The present study found that, the cause of chest trauma to be assault; 42%, road traffic accident; 31%, work related; 20% while other causes represented 7% of cases. This is similar to the results of **WHO**⁽¹¹⁾, which reported that the major causes of injury in Egypt were violence/assault, falls, road traffic injuries, and work- related injuries, with variations in age groups and gender. **Ali and Gali**⁽¹²⁾ and **Albadani and Alabsi**⁽¹³⁾, reported that penetrating chest trauma was the main cause of chest injuries. They attributed the predominance of assault in penetrating chest trauma to the ownership and use of guns in Yemen. In contrast **Narayanan et al.**,⁽⁵⁾ study reported that the most common modes of chest injury was vehicular crashes in 59.7 % followed by assault. **Saeed et al.**,⁽⁸⁾ study also showed that the common cause of injuries was road traffic accident; 73% while 14% were involved in attacks of whom 8% were by stabbings. **Ayman et al.**,⁽¹⁴⁾ found that Road Traffic Accidents (RTAs) caused 81.25% of chest injuries in KSA.

Our work found that 47% of cases had open cardiothoracic injury, 26% had closed lung injury and hemothorax. 18% had chest cage fracture while 9% had pneumothorax only. Rib fracture was the most common chest injury seen in 724 out of the 1258 patients of the study of **Narayanan et al.**⁽⁵⁾. **Saeed et al.**⁽⁸⁾ stated that the commonest findings were rib fractures in 56.7%, hemothorax in 14.7%, and pneumohemothorax in 14% while pneumothorax was found in 11.3% of cases.

Nwafor et al.,⁽¹⁵⁾ reported that the type of injury was hemothorax (20.9%), hemopneumothorax (16.2%), and pneumothorax (17.4%). Pneumothorax includes simple, open and tension types as well as multiple ribs fractures, which constituted the majority. Rib fractures occurred in 34% of patients and was the most common type of

injury due to blunt trauma in the study of **Mefire et al.**⁽¹⁶⁾ and **Hanafi et al.**⁽⁹⁾.

It is widely accepted that the number of fractured ribs indicates the severity of trauma and closely correlates with morbidity and mortality. Patients with any number of rib fractures should be carefully screened for co-existing injuries in other body systems and hospitalized to receive proper treatment⁽¹⁷⁾. Often a combination of chest injuries were present. Lung contusion (32%) was the most common parenchymal lung injury. Lung collapse was seen in 12% of cases⁽⁷⁾.

Studied cases showed that the predominate associated lesions were skull injury and limb fractures. Internal hemorrhage was found in 16% of cases while pelvic fractures were in 5% of cases. **Narayanan et al.**,⁽⁵⁾ found that abdominal visceral injuries were the commonest associated injuries and that the commonest solid abdominal organ injury was the liver (16%) followed by spleen (8%) pancreas (2%) and kidney (2%). **Kumar et al.**,⁽⁷⁾ found that the commonest extrathoracic associated injuries were limb fractures in 37.3%, head and neck injuries in 13.3% and 2.7% in the pelvis.

Management was conservative in 25%, surgical in 58% and by insertion of chest tube in 17%. The present study also showed that thirty percent of cases were cured while 52% of cases developed complications. Eighteen cases (18%) died from different causes. **Kumar et al.**,⁽⁷⁾ stated that overall 76 % patients required tube thoracostomy and 24% patients were managed conservatively. Pneumonia was the most common complication encountered followed by septicaemia and pyothorax Tube thoracostomy was the commonest intervention undertaken in 65 (45 %) patients. Seventeen (11.88 %) patients were managed with mechanical ventilation⁽¹⁰⁾. Associated extra thoracic injuries resulted in higher mortality as compared to isolated chest injuries⁽¹⁴⁾.

The present study showed that the causes of death from thoracic injuries were cardiac arrest; 44.4%, respiratory failure; 33.3% and infection; 22.3%. **Ekpe and Eyo**⁽¹⁸⁾, found that associated extra thoracic organ injury, late presentation beyond 24 hour post trauma and severe chest injury with bilateral chest involvement were the determinants of mortality in chest trauma.

CONCLUSION

Chest trauma is an important public health problem accounting for a substantial proportion of all trauma admissions at Al-Hussein Hospital. The highest incidence of chest trauma was found in 3rd and 4th decades. Most of the injuries were due to assault related injury followed by road traffic accident which could be explained by characters of population activities in the area surrounding Al-Hussein hospital, commonest injury was skull injury and management was surgical in

58%. The main cause of death from thoracic injuries was cardiac arrest.

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