

Original Research

Assessment of pattern and outcome of chest trauma patients

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ABSTRACT:

Background: Thoracic trauma refers to injuries that affect the chest area, including the ribcage, lungs, heart, and other vital structures within the chest cavity. The present study was conducted to assess the pattern and outcome of chest trauma patients. **Materials & Methods:** 116 chest trauma patients of both genders were enrolled and the pattern of chest injuries, indications for emergency thoracotomy, morbidity, and causes of death were recorded. **Results:** Out of 116 patients, males were 74 and females were 42. The pattern of chest injuries was rib fracture in 61% of cases, flail chest in 25%, hemothorax in 12%, pneumothorax in 11%, lung contusion in 27%, diaphragmatic injury in 12% and fracture sternum in 9% cases. The indications for emergency thoracotomy was lung laceration in 7%, ED thoracotomy in 13%, right atrial injury in 7%, right ventricular injury in 5%, aortic injury in 2% and diaphragmatic injury in 16%. Morbidity was due to wound infection in 3%, empyema in 5%, retained hemothorax in 8%. The causes of death was sepsis in 2%, respiratory failure in 5%, head injury in 3% and hemorrhagic shock in 1% cases. The difference was significant ($P < 0.05$). **Conclusion:** In most cases, the pattern of chest injuries was rib fracture and flail chest. The morbidity was due to wound infection, empyema, retained hemothorax.

Key words: Thoracic trauma, rib fracture, pneumothorax

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INTRODUCTION

Thoracic trauma refers to injuries that affect the chest area, including the ribcage, lungs, heart, and other vital structures within the chest cavity. Thoracic trauma can result from various causes, including accidents, falls, sports injuries, and violence. It is essential to recognize and treat thoracic trauma promptly, as it can be life-threatening.¹

Common types of thoracic trauma include rib fractures, pneumothorax, hemothorax, flail chest, cardiac trauma, pulmonary contusion, tracheobronchial injury, etc. Fractured ribs are a frequent consequence of chest injuries.² These fractures can be painful and may result in complications like lung injury, especially if broken ribs puncture the lung tissue. A pneumothorax occurs when air accumulates in the space between the lung and the chest wall, causing lung collapse. This can be spontaneous or result from trauma. Hemothorax is the accumulation of blood in the pleural space (the space between the lung and the chest wall).³ It is often caused by chest injuries and can lead to breathing

difficulties. A flail chest occurs when multiple adjacent ribs are fractured in more than one place, making a segment of the chest wall unstable. This can result in paradoxical chest movement during breathing. A pulmonary contusion is a bruise on the lung tissue. It can develop after a blunt chest injury and lead to impaired lung function.⁴ Injuries to the heart, such as a myocardial contusion (bruising of the heart muscle) or cardiac rupture, can be caused by chest trauma. These injuries can be life-threatening and require immediate medical attention. Trauma to the trachea (windpipe) or bronchi (airway tubes) can result from chest injuries. These injuries may disrupt airway function and require surgical intervention.⁵ The present study was conducted to assess the pattern and outcome of chest trauma patients.

MATERIALS & METHODS

The present study consisted of 116 chest trauma patients of both genders. A written consent to participate in the study was obtained from family members.

Data such as name, age, gender, etc. was recorded. Radiological investigations, biochemical parameters, and emergency room procedures were recorded. The pattern of chest injuries, indications for emergency

thoracotomy, morbidity, and causes of death were recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 116		
Gender	Male	Female
Number	74	42

Table I shows that out of 116 patients, males were 74 and females were 42.

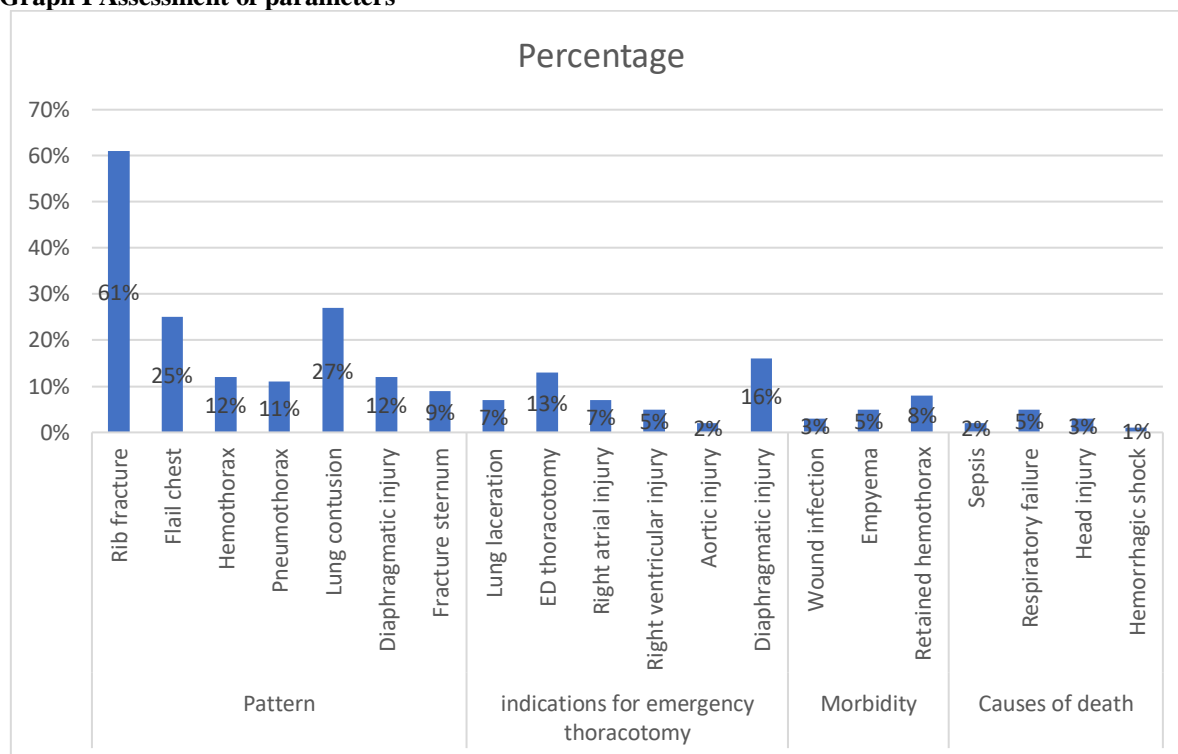
Table II Assessment of parameters

Parameters	Variables	Percentage	P value
Pattern	Rib fracture	61%	0.75
	Flail chest	25%	
	Hemothorax	12%	
	Pneumothorax	11%	
	Lung contusion	27%	
	Diaphragmatic injury	12%	
	Fracture sternum	9%	
indications for emergency thoracotomy	Lung laceration	7%	0.05
	ED thoracotomy	13%	
	Right atrial injury	7%	
	Right ventricular injury	5%	
	Aortic injury	2%	
	Diaphragmatic injury	16%	
Morbidity	Wound infection	3%	0.52
	Empyema	5%	
	Retained hemothorax	8%	
Causes of death	Sepsis	2%	0.67
	Respiratory failure	5%	
	Head injury	3%	
	Hemorrhagic shock	1%	

Table II, graph I shows that the pattern of chest injuries was rib fracture in 61% of cases, flail chest in 25%, hemothorax in 12%, pneumothorax in 11%, lung contusion in 27%, diaphragmatic injury in 12% and fracture sternum in 9% cases. The indications for emergency thoracotomy was lung laceration in 7%, ED thoracotomy in 13%, right atrial injury in 7%,

right ventricular injury in 5%, aortic injury in 2% and diaphragmatic injury in 16%. Morbidity was due to wound infection in 3%, empyema in 5%, retained hemothorax in 8%. The causes of death was sepsis in 2%, respiratory failure in 5%, head injury in 3% and hemorrhagic shock in 1% cases. The difference was significant (P< 0.05).

Graph I Assessment of parameters



DISCUSSION

Traumatic injuries are the leading cause of death worldwide.⁶ Head and spinal cord injury is the common site of injury followed by thoracic trauma which is the third most common traumatic death.⁷ The prevalence is about 10% of trauma admissions and the mortality rate varies from 10%-60%. Polytrauma is a serious global health problem.^{8,9} Damage to the esophagus can occur with thoracic trauma, leading to difficulty swallowing, chest pain, and other symptoms.^{10,11} The present study was conducted to assess the pattern and outcome of chest trauma patients.

We found that out of 116 patients, males were 74 and females were 42. Narayanan et al¹² analyzed the presentation, patterns, and outcome of chest trauma in a level-1 urban trauma center. It was a prospective observational study of all patients presented with chest trauma to an urban level 1-trauma center over a period of 3 years. Demographic profile, mechanism of injury, injury severity scores (ISS), associated injuries, hospital stay, etc. were recorded. Chest injuries comprised 30.9 % of all trauma admissions and the mechanism was blunt in majority (83.5 %) of the cases. Vehicular crashes (59.7 %) followed by assault were the most common modes of injury. Rib fracture was the most common chest injury seen in 724 of the 1258 patients while abdominal visceral injuries were the commonest associated injuries in polytrauma cases. The majority of the patients were managed non-operatively. Intercostal tube drainage (ICD) was the mainstay of treatment in 75 % of the cases, whereas, thoracotomy was required only in 5.56 % of the patients. Overall mortality was 11 %

and it was found to be significantly higher following blunt chest trauma. They observed that associated extra thoracic injuries resulted in higher mortality as compared to isolated chest injuries. Thoracic injuries can be readily diagnosed in the emergency department by meticulous and repeated clinical evaluation and majority require simple surgical procedures to prevent immediate mortality and long-term morbidity.

We found that the pattern of chest injuries was rib fracture in 61% of cases, flail chest in 25%, hemothorax in 12%, pneumothorax in 11%, lung contusion in 27%, diaphragmatic injury in 12% and fracture sternum in 9% cases. The indications for emergency thoracotomy was lung laceration in 7%, ED thoracotomy in 13%, right atrial injury in 7%, right ventricular injury in 5%, aortic injury in 2% and diaphragmatic injury in 16%. Morbidity was due to wound infection in 3%, empyema in 5%, retained hemothorax in 8%. The causes of death was sepsis in 2%, respiratory failure in 5%, head injury in 3% and hemorrhagic shock in 1% of cases. Dongel et al¹³ studied 1139 patients with thorax trauma of which 61.3% were male and 38.7% were female. Study results demonstrated that blunt trauma contributed 95.7% and penetrating trauma 4.3%. Etiological factors were falls in 792 (69.5%), motor vehicle accidents in 259 (22.8%), animal related accidents in 39 (3.4%) and penetrating injuries in 49 (4.2%) patients. It was found that 229 (20%) patients had single, 101 (8.9%) had double, 5 (3%) had three or more, 10 (0.9%) had bilateral rib fractures and 19 (1.7%) had sternal fracture. Pneumothorax was diagnosed in 58 (5.1%) patients, whereas hemothorax, hemopneumothorax and other system injuries were

diagnosed in 36 (3.2%), 38(3.3%) and 292 (25.6%) respectively.

The limitation of the study is the small sample size.

CONCLUSION

Authors found that in most cases, the pattern of chest injuries was rib fracture and flail chest. The morbidity was due to wound infection, empyema, retained hemothorax.

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