

Original Research

Assessment of cases of traumatic chest injuries reported to general surgery department

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ABSTRACT:

Background: Traumatic injuries are the leading cause of death worldwide. Head and spinal cord injury is the common site of injury followed by thoracic trauma. The present study evaluated various traumatic chest injuries among patients reported to general surgery department. **Materials & Methods:** 114 patients (64 males and 50 females) of traumatic chest injuries were studied. Etiology and clinical features of cases was also recorded. **Results:** Maximum males and females cases were seen in age group 40-50 years (33%) and (45%) respectively. Least cases were seen in age group >50 years in 10% males and 15% females. Etiology found to be blunt thoracic traumas in 84 cases which comprised of low impact fall in 41, high impact fall in 29 and animal accident in 14 cases and penetrating thoracic traumas in 30 cases which comprised of stabbing injuries in 22 and firearm injuries in 8 cases. Clinical features comprised of rib fracture in 65% of cases, flail chest in 21%, hemothorax in 15%, pneumothorax in 12%, lung contusion in 22%, diaphragmatic injury in 16% and fracture sternum in 7% cases. **Conclusion:** Maximum chest trauma cases involved males as compared to females and main etiology factor found to be blunt thoracic traumas due to low impact fall and high impact fall.

Key words: Chest trauma, diaphragmatic injury, thoracic traumas

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INTRODUCTION

Traumatic injuries are the leading cause of death worldwide. Head and spinal cord injury is the common site of injury followed by thoracic trauma which is the third most common traumatic death.¹ The prevalence is about 10% of trauma admissions and mortality rate varies from 10%-60%. Polytrauma is a serious global health problem.²

It is evident in most of the researches that mortality due to trauma rank third after cardiovascular diseases (CVDs) and cancers. Most common age group that encounters these types of injuries are 1-4 decades.³ As chest is a large and exposed portion, it is expected to get traumatized in most of the impact injuries. Thoracic cage houses the most vital organs- heart, lungs and great vessels, therefore trauma to these organs can prove fatal.⁴ A life-threatening condition may be seen if there is injury of esophagus, trachea, heart, diaphragm and large vessels. The main cause of traumatic chest injuries is road side accident, physical violence, fall etc. The etiology and pattern of chest

injuries vary worldwide due to variations in infrastructure, civil violence, wars, level of crime as well as the applicability of traffic rules and regulations.⁵

Young age group owing to use of high-speed motor vehicles and rapid unplanned urbanization are among leading causes. The outcome of thoracic trauma is variable and is affected by the interaction between several demographics and anatomical factors.⁶ The present study evaluated various traumatic chest injuries among patients reported to general surgery department.

MATERIALS & METHODS

The present study comprised of 114 patients brought to general surgery department with traumatic chest injuries. The consent from patients' relative for conducting the study was obtained beforehand.

A case history proforma was designed. All patients underwent routine laboratory investigations which comprised of random blood glucose, complete blood

count (CBC), and arterial blood gases (ABG) along with electrocardiogram and echocardiography (ECG). A chest X-ray, and computed tomography (CT) scan was taken. Etiology and clinical features of cases was

also recorded. Results of present study were analysed statistically. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of cases based on age group

Age group (Years)	Males	Females	P value
20-30	25%	12%	< 0.05
30-40	32%	28%	
40-50	33%	45%	
>50	10%	15%	

Table I shows that maximum males and females cases were seen in age group 40-50 years (33%) and (45%) respectively. Least cases were seen in age group >50 years in 10% males and 15% females. The difference was significant (P< 0.05).

Table II Etiology of cases

Etiology	Variables	Number	P value
Blunt thoracic traumas (84)	Low impact fall	41	< 0.05
	High impact fall	29	
	Animal accident	14	
Penetrating thoracic traumas (30)	Stabbing injuries	22	< 0.05
	Firearm injuries	8	

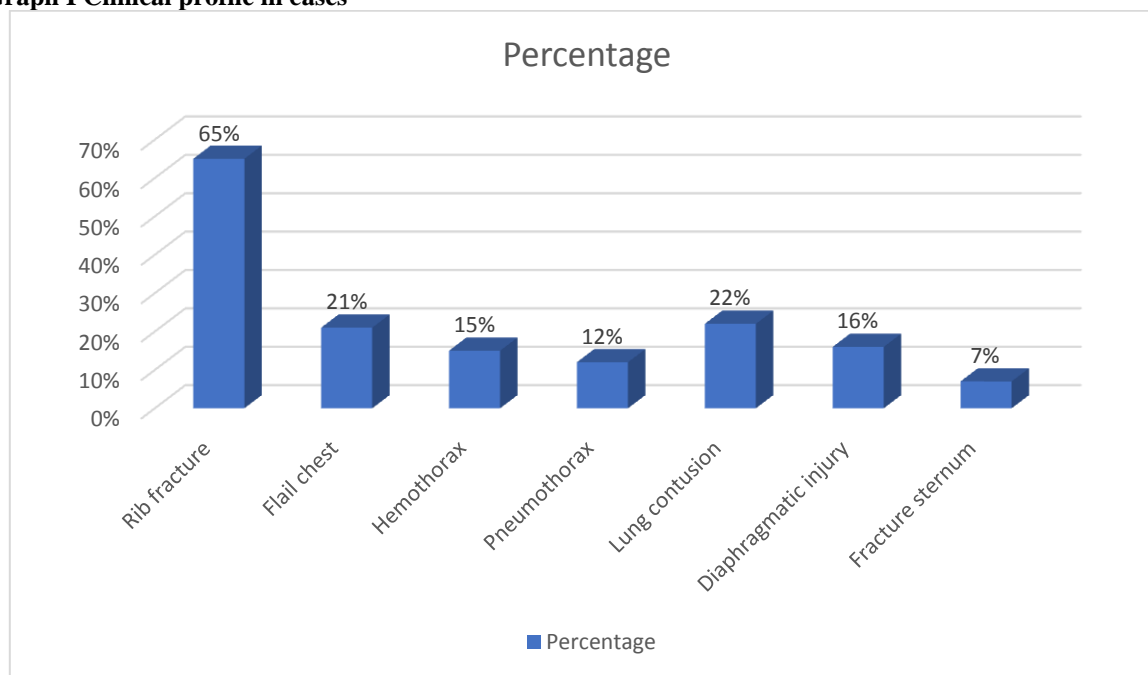
Table II shows that etiology found to be blunt thoracic traumas in 84 cases which comprised of low impact fall in 41, high impact fall in 29 and animal accident in 14 cases and penetrating thoracic traumas in 30 cases which comprised of stabbing injuries in 22 and firearm injuries in 8 cases. The difference was significant (P< 0.05).

Table III Clinical profile in cases

Features	Percentage	P value
Rib fracture	65%	< 0.05
Flail chest	21%	
Hemothorax	15%	
Pneumothorax	12%	
Lung contusion	22%	
Diaphragmatic injury	16%	
Fracture sternum	7%	

Table III, graph I shows that clinical features comprised of rib fracture in 65% of cases, flail chest in 21%, hemothorax in 15%, pneumothorax in 12%, lung contusion in 22%, diaphragmatic injury in 16% and fracture sternum in 7% cases. The difference was significant (P< 0.05).

Graph I Clinical profile in cases



DISCUSSION

Thoracic injuries mostly occur as a result of multiple traumas. Early diagnosis and prompt treatment is life-saving. Early mobilization, pain management, proper fluid replacement and respiratory physiotherapy are key factors determining outcome of treatment.⁷ Patients with airway ailment, refractory problems with gas exchange, hypoventilation, and decreased mental status can be well managed with endotracheal intubation. The greatest risk for pneumonia, respiratory failure, and multiple organ failure are most commonly seen in the elderly.⁸

The most complications in these patients include respiratory failure due to altered chest wall mechanics from the fractures and respiratory distress from fracture-associated pain.⁹ Underlying pulmonary contusion plays a prominent role in the hypoxia that develops after chest wall injury. This complex pathophysiology often necessitates endotracheal intubation, prolonged mechanical ventilation, tracheostomy, and prolonged intensive care unit length of stay.¹⁰ In addition, poor pulmonary function and mechanical ventilation increase the risk for the development of pneumonia, which is a frequent cause of death. Several factors such as age, the total number of fractures, and the presence of bilateral fractures have been shown to contribute to the morbidity and mortality associated with thoracic wall injury.¹¹ The present study evaluated various traumatic chest injuries among patients reported to general surgery department.

In present study, there were 114 patients with 84 males and 30 females. Maximum males and females cases were seen in age group 40-50 years (33%) and (45%) respectively. Least cases were seen in age group >50 years in 10% males and 15% females.

Kumar et al¹² conducted a study among 125 patients (males-73, females-52). Out of which 86 patients were of blunt injuries and 39 were of penetrating injuries. The type of chest injury was rib fracture in 104, pneumothorax in 45, haemothorax in 56, Hemopneumothorax in 67, lung contusion in 34, flail chest in 12, fracture sternum in 72 and diaphragmatic injury in 17.

We observed that etiology found to be blunt thoracic traumas in 84 cases which comprised of low impact fall in 41, high impact fall in 29 and animal accident in 14 cases and penetrating thoracic traumas in 30 cases which comprised of stabbing injuries in 22 and firearm injuries in 8 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.

Massaga et al¹⁴ in their study recorded 33.3% cases of head injury and 26.7% cases of musculoskeletal injuries. The associated injuries are related to the cause of injury as road traffic accidents always lead to multiple injuries whereas as assault lead to isolated injuries. Narayanan et al¹⁵ 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. Majority of the patients were managed non-operatively. Inter costal tube drainage (ICD) was the main stay 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.

CONCLUSION

Authors found that maximum chest trauma cases involved males as compared to females and main etiology factor found to be blunt thoracic traumas due to low impact fall and high impact fall.

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