

An Analytic Study of Blunt Chest Trauma

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Background: Thoracic injury is a common cause of mortality and major disability. Fortunately, the vast majority of chest trauma can be conservatively managed. This retrospective study was carried out to determine the magnitude of the condition, and the management of patients with blunt chest trauma at our center.

Methods: The records were reviewed of 163 patients seen at Al-Thora Teaching Hospital in El-Beida, Libya from October 2008 to December 2016. Demographic data, etiology, mechanism and pattern of injury, associated injury, management, and outcome data were analyzed.

Results: The data analysis showed that: chest trauma predominated among males with a percentage of 77.9 % relative to the female group whose percentage was 22.1%. The commonest causes of chest trauma were road traffic accidents (RTAs) representing 85.9%. The most frequent injury was rib fracture (78.5%). Intercostal tube thoracostomy was the only therapy required in 71 patients (43.6%), whereas 78 patients (21.2%) had had conservative management, and only 14 patients (8.6%) underwent thoracotomy. Mortality occurred in 9 patients (5.5%).

Conclusions The study revealed that, road traffic accidents (RTAs) are the main cause of blunt chest trauma, mainly affecting young males. Mostly they required no invasive therapy or, at the most chest tube thoracostomy.

Keywords: Blunt chest trauma, Injury pattern, Management, Outcome, El-Beida, Libya

Introduction

Trauma is one of the leading causes of morbidity and mortality worldwide. Thoracic trauma comprises 10-15% of all traumas. [1,2] It directly accounts for approximately 25% of trauma related mortality and is a contributing factor in another 25%. [3] Fortunately, the vast majority of chest trauma can be conservatively managed. [3] Since most chest trauma is preventable, it is important to understand the etiology, injury pattern, and management protocols. In this retrospective review of blunt chest trauma patients we aimed to study the etiology, injury pattern, management, and outcome of their blunt chest trauma.

Methods

This is a retrospective record from January 2008 to December 2016 conducted at Al Thora Teaching Hospital in El-Beida, Libya. All patients who were hospitalized due to blunt chest trauma with the criteria of intrathoracic injury, and clinically significant rib cage injury including single rib fracture were included. Excluded were patients who were brought dead to the Emergency Department, and patients who did not complete their treatment in our hospital. Data collected consisted of demographics, causes and pattern of lesions, presence of associated injuries, management, and outcome of blunt chest trauma. The statistical analysis of the data was done using Microsoft Excel software.

Results

Our study included 127 male and 36 female patients (Table 1) with a mean age of 38.4 years (range: 15-71 years). Road Traffic Accidents were the commonest cause of injury, comprising 85.9% of the cases. The most frequent injury was fracture of ribs seen in 78.5% of the patients (Table 2), followed by pneumothorax (22.1%), haemothorax (16.6%) and lung contusion (12.3%). Other injuries were relatively rare: flail chest was diagnosed in 7 patients (4.1%), lung laceration in 11 patients (6.7%), diaphragmatic injury in 7 patients (4.1%) and 3 patients (1.8%) had had tracheobronchial injury. 103 patients had associated extra thoracic injuries, mostly musculoskeletal injuries (54.6%). 47 patients (28.8%) were managed conservatively, 102 patients (62.6%) required chest tube insertion and only 14 patients (8.6%) underwent thoracotomy. The overall mortality in this study was 9 patients (5.5%).

Discussion

Blunt chest injuries are among the most important problems in civil practice and more frequent than penetrating trauma. [4, 5] Road traffic accidents (RTAs) were overall the most common mechanism of injury accounting for 85.9% of the patients. This frequency is probably related to the rising levels of road traffic congestion, the availability of new high-speed vehi-

Table 1: Patients distribution according to age, sex and etiology of blunt chest trauma.

Variables	Number of Patients	Percentage (%)
Age (years)		
≤ 20	6	3.7%
21 – 40	99	60.7%
> 40	58	35.6%
Sex		
Males	127	77.9%
Females	36	22.1%
Etiology		
RTA	140	85.9%
FD	18	11%
Assault	5	3.1%

cles, and ignorance or unawareness of traffic control procedures. Our result conforms to the findings of other studies. [6,7,8,]

Blunt chest trauma predominated among males with a percentage of 77.9% relative to the female group (22.1%). The majority of patients (60.7%) were in the age group of 21-40 years. It is well recognized that young males are more likely than others to be involved in outdoor activities, driving of motor vehicles, and working on construction sites, and other hazardous occupations. [9, 10]

Rib fractures are the most common injury following blunt chest trauma. [11, 12, and 13] In our series, rib fractures occurred in 78.5% of the patients and 64% of them had other types of thoracic injury mainly hemo\pneumothorax and lung contusion. [14, 15]

Flail chest deformity is a serious manifestation of rib fracture and can lead to respiratory failure from the direct effect on the lungs as well as impaired ventilation due to dysfunction of normal chest wall mechanics. [16, 17] In our study seven patients (4.1%) presented with flail chest. All patients with flail chest had been followed in the Intensive Care Unit and managed by oxygen inhalation, parenteral analgesics, and chest tube drainage. Five patients had required in their management positive pressure ventilation because of acute respiratory distress.

Tracheobronchial rupture from blunt chest injury is associated with higher overall morbidity and mortality. [18] Tracheobronchial injuries were documented in 1.8% of the patients in our series. Surgical repair was successful in all the cases who had been managed surgically, and no complications or mortality were documented.

Diaphragmatic rupture is present in 1 to 6% of major thoracic injuries. [19] We had 7 (4.1%) patients diagnosed with diaphragmatic injury which were repaired during the laparotomy for intra-abdominal injuries. Cardiac and great vessels injuries are relatively rare-

Table 2: Patients distribution according to pattern of injuries and management of chest blunt trauma.

Variables	Number of Patients	Percentage (%)
Pattern of chest injuries		
Fracture ribs	128	
Pneumothorax	36	78.5%
Haemothorax	27	22.1%
Hemopneumothorax	14	16.6%
Lungs contusion	20	8.6%
Lungs laceration	11	12.3%
Flail chest	7	6.7%
Diaphragmatic injuries	7	4.1%
Tracheobronchial injuries	3	4.1%
Associated injuries		
Musculoskeletal	89	1.8%
Neurotrauma	16	54.6%
Abdominal	17	9.8%
Management		
Conservative	47	10.4%
Tube thoracostomy	102	28.8%
Thoracotomy	14	62.6%

ly seen in hospital as the patients rarely survive the severe originating traumatic insult. [20] In our series we did not report any cardiac or major vascular injury.

Extrathoracic associated injuries were reported in 11% of patients (68.7%) in this study, and the injuries were mainly musculoskeletal. This is similar to the findings of others. [21, 22] However, some studies reported neurotrauma rather than musculoskeletal to be the more common association. [23, 24]

Tube thoracostomy is the most frequent intervention undertaken among chest trauma patients. [24, 25] It effectively drains the pleural space, re-expands the lung, and serves to tamponade bleeding by bringing the lung surface up against the thoracic wall. In our study, 102 patients (62.6%) were treated by the tube thoracostomy technique, with the indications of drainage of a pneumothorax, or haemothorax.

Internationally the rate of thoracotomy is approximately 5% in blunt, and 30% in penetrating thoracic trauma. [26, 27] In our studies 14 patients (8.6%) required thoracotomy because of massive haemothorax, persistent air leak, or haemodynamic instability. The estimated mortality for blunt chest trauma is quoted between 2.2% and 33% in various studies. [8, 10, 26] In our study the overall mortality of 5.5% lies well within the lower margin of the reported range.

Conclusions

Our study revealed that blunt chest trauma is most commonly seen in young males and mostly results from RTAs. The majority of blunt chest trauma patients can be treated conservatively or, at most require chest tube thoracostomy.

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Burden of chronic obstructive pulmonary disease: Healthcare costs and beyond



Chronic obstructive pulmonary disease (COPD) is a progressive and debilitating respiratory condition that leads to significant burden, both medically and financially. It affects millions of people worldwide and causes significant morbidity and mortality. Most detailed information related to its prevalence, morbidity, and mortality comes from high-income countries, but 90% of COPD-related deaths occur in low- and middle-income countries. Cigarette smoking is the main risk factor for developing COPD, but other risk factors do exist and need to be recognized. A majority of morbidity and mortality as well as health care costs occur from acute exacerbations of COPD with a known phenotype of patients being “frequent exacerbators.” Health care costs for COPD are not only from treatment of exacerbations, such as hospitalization, but also medication costs for maintenance therapy and outpatient treatment. COPD has been linked with many comorbidities leading to significant burden of disease. The goal of this review is to evaluate the overall burden of disease including prevalence, morbidity, mortality, health care costs, and economic costs.