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Severe Chest Trauma In Jos, Nigeria:Pattern And Outcome Of Management

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Summary

Background: Chest trauma is a significant cause of mortality and morbidity world over especially among young productive members of the society. Prompt recognition and early intervention is the key to successful management.

Setting: Jos University Teaching Hospital Jos in the middle belt of Nigeria.

Objective: To evaluate the pattern and management outcome of chest trauma and to audit existing practice.

Patients and Methods: This was a prospective study of all consecutive patients presenting with chest trauma at the accident and emergency department between January 1999 and December 2005 requiring resuscitation, admission and observation.

Results: One hundred and ninety eight patients were studied. Their ages ranged from 6 years to 70 years with a mean age of 34 years. There were 165 males and 33 females giving a male to female ratio (M: F) of 5:1. Road traffic accident (RTA) was the most common aetiology accounting for 70.7% of cases. Blunt chest injury resulted in 72.2% of the cases while penetrating injury was encountered in 27.8% of the cases. Chest wall contusion was the most common clinical pattern of injury and accounted for 24.4% of the injuries. Drivers of vehicles involved in RTA were most commonly affected by chest trauma and accounted for 26.7% cases. Eighty two patients had associated injuries. Extremity fractures were the most commonly associated injury and were found in 38 patients (33.3%). A mortality of 4.5% was recorded

Conclusion: Significant mortality occurs following chest trauma which is a common occurrence in young active members of the society. Drivers often suffer this injury following road traffic accidents due to their occupational exposure. Chest trauma could be adequately managed through early detection and prompt intervention.

Keywords: Chest trauma, pattern, early detection, prompt intervention

Introduction

Chest trauma is a common occurrence and contributes significantly to morbidity and mortality in trauma patients. The aetiology ranges from blunt to penetrating chest injuries. Penetrating injuries are usually due to gunshot, impalements and stab wounds and result from wars, civil crises, assaults and occasionally road traffic accidents[1, 2, 3] On the other hand, road traffic accident has been implicated as the main cause of blunt chest injuries. Increase in high speed mobility both in developed and developing countries has resulted in the rising incidence of chest trauma world wide.

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It is known that about 10% of chest trauma patients die on the spot and another 5% on arrival in the hospital.[1, 3, 4,5] Such rapidly occurring deaths result from aortic injuries tension pneumothorax and myocardial injuries. Chest trauma may affect the chest wall or any of the intra-thoracic visceral organs. The different clinical entities that make up chest injury include; chest wall contusions, rib fractures, flail chest, clavicular and sternal fractures, pleural collections major vascular injuries, lung contusions/ lacerations, tracheo-bronchial injuries and cardiac tamponade[5].

In the management of chest trauma, a high index of suspicion, immediate resuscitation and tube thoracostomy drainage would save up to 90% of the patients.[1] A few patients will require thoracotomy. This prospective study is undertaken to elucidate the pattern and management outcome of patients who had chest trauma in Jos University Teaching Hospital in addition to auditing the existing practice.

Patients and methods

Consecutive patients that presented with chest trauma to the accident and emergency department of the Jos University Teaching Hospital between January 1999 and December 2005 were recruited into this prospective study. Clinical examination of the patients were done at the casualty by the doctors on call and entered into a pre-planned proforma that included demographic data, type of injury, clinical presentation, aetiology, associated injuries and treatment offered. Patients were further examined in the wards and on discharge, the duration of hospital stay, outcome of treatment and any complications encountered were further recorded. Chest X-rays were done as indicated and used to monitor recovery in addition to clinical assessment.

For the purpose of this study, chest trauma included any injury to the thoracic cage ranging from the skin to the intra-thoracic viscera. Patients that died on the spot and those with trivial injuries to the chest not requiring admission or observation were excluded from the study. Recovery was said to have occurred with complete healing of any penetrating injury, normal vital signs, return of vesicular breath sounds, cessation of pain and cough, radiological evidence and general fitness of the patients. Patients were followed up for six months after discharge. Data collected was statistically analyzed for means, standard deviation and percentages using Epi-info. Version 3.2.2

Results

One hundred and ninety eight patients were involved in the study with their ages ranging from 6years to 70years. The mean age was 34 years. There were 165males and 33 females giving a male: female ratio of 5:1. One hundred and forty three (72.2%) had blunt chest trauma while 55 (27.8%) had penetrating chest trauma. Nine percent of the patients were within the 0-20 years age bracket, 9.6% were aged 51-70 years while the rest 71.4%fell within 21-50 years age group (table 1).

One hundred and forty (70.7 %) resulted from road traffic accidents, 39 (19.7%) were from injuries sustained in sectarian crises, 13 (19.7%) were due to domestic and industrial accidents while 6 (3%) resulted from assault. Eighty two (41.8%) patients had only chest injury, 38 (19.4%) had associated extremity fractures, 32 (16.3%) had associated head injury, 24 (12.2%) had abdominal injuries and 20 (10.2%) had soft tissue injuries (table 2). Majority of the patients were drivers of the vehicles involved in RTA, i.e. 53 patients (26.8%), 41 patients (20.7%) were farmers while 34 patients (17.2%) were students. (Fig)

The duration of hospitalization ranged between one and 168 days with a mean duration of 15days. Prolonged hospitalization beyond two weeks was due to complications or associated injury to other systems in all cases. Chest wall contusion, uncomplicated rib fractures and thoraco-abdominal injuries accounted for 24.2%, 14.1% and 13.6% respectively followed closely by rib fractures with pleural effusion 11.6%. The least occurring injury was sternal fracture representing 0.5% (table 3).

One hundred and forty patients did not require blood transfusion during resuscitation. (70.7%) while 58 (29.3%) had blood transfusion. The transfused patients had haemodynamic instability from excessive blood loss. Twenty patients developed complications after initial resuscitation. These included empyema thoracis (11) septicaemia (6) and fracture non union (3). We recorded 9 deaths giving a mortality rate of 4.5%. All deaths occurred within the first 5 days of admission with 6 of the patients dying in the course of resuscitation while 3 died on admission in the ward.

Table 1. Age distribution of the study population

Age group	No. of patients	Percentage (%)
0-10	4	2
11-20	14	7
21-30	68	34.3
31-40	61	30.8
41-50	32	16.2
51-60	15	7.6
60-70	4	2
TOTAL	**198**	**100**

Table 2. Associated injuries in 198 patients with chest injury

Associated injury	Frequency	Percentage (%)
Extremity fracture	38	33.3
Head and Neck	32	28.1
Abdomen	24	21.1
Skin and Soft tissue	17.5	17.5
TOTAL	**114**	**100**

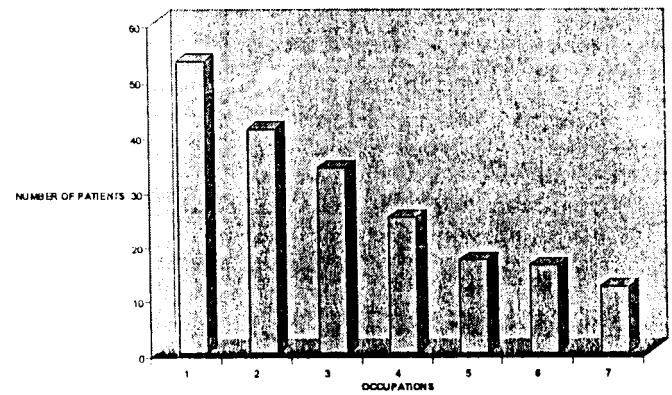
Table 3. Clinical pattern of chest injury in 198 patients

Injury Type	No of Patients	Percentage
Chest Wall Contusion	48	24.2
Cardiac/ Aortic Injuries	2	1
Lung Contusion	5	2.5
Flail Chest	4	2
Diaphragmatic Rupture	5	2.5
Uncomplicated Rib Fractures	28	14.1
Rib Fractures with Pleural Collection	23	11.6
Thoraco-Abdominal Injury	27	13.6
Tension Pneumothorax	3	1.5
Sucking Chest Wound	7	3.5
Sternal Fracture	1	0.5
TOTAL	**198**	**100**

Discussion

In this series, it can be inferred that 65.1% of chest trauma victims were young adults between the ages of 20 and 40 years. This is in conformity with Odelowo's series at Ilorin[3], Adebonojo's[1] in Washington DC, Ali and Gali in Maiduguri.[6] This is also the age group that is most often involved in road traffic accident. The reason adduced is that they are a much more mobile age group[1]. It is also in accord with the finding of road traffic accident as the most common aetiology of chest trauma in our environment[3].

Fig. Bar chart showing the distribution of the study population by occupation



KEY
1. Drivers
2. Farmers
3. Students
4. Applicants
5. Civil servants
6. Business persons
7. Others

It is noted that chest wall contusion is the most commonly occurring injury. This is in contrast with the Maiduguri study that recorded uncomplicated rib fractures as the most common. The most frequently encountered aetiologic factor was road traffic accident. This is in consonance with the known aetiology of chest trauma in many series.[2, 3, 7, 9] It is note worthy that the patients involved in chest trauma were found to be mainly drivers of vehicles, followed by farmers, students and applicants in that order. This may be due to the occupational exposure of drivers to road traffic accident while the others are the population at risk of involvement in sectarian/ civil crises and assaults[8, 9, 10]

The most commonly associated injury in this series is extremity injury followed by head and neck injuries. This underscores the need for a high index of suspicion when managing cases of extremity and head injuries. Nine mortalities were recorded in this study and all this deaths were within five days of admission. Aside from the mortalities recorded, resuscitation was generally satisfactory in majority of the patients.

In conclusion therefore, chest trauma occurs more commonly in young adults. Drivers involved in road traffic accident are frequently affected. Even though severe cases result in instant mortality, adequate early resuscitation and a good knowledge of what to do would save majority of the patients from untoward complications and death.

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