

Profile of chest trauma patients at B.P. Koirala Institute of Health Sciences, Dharan, Nepal

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Abstract

Background: Chest trauma is a major public health problem. It includes injury to chest wall, pleura, tracheobronchial tree, lungs, diaphragm, esophagus, heart and great vessels. It comprises 10-15% of all traumas and 25% of death due to trauma occurs because of chest injury. Chest trauma is seen with increasing frequency in urban hospitals. **Methods:** A prospective study of all patients with chest injury irrespective of age, sex and mode of injury presenting to BPKIHS emergency were included in this study from 15th March 2007 to 14th March 2008. **Results:** During the study period of one year total trauma patients presented to emergency were 1524. Out of this 122 patients were of chest injury. It comprises 8% of all trauma patients. Majority of patients belonged to the age group (21-40) years. Out of 122 patients, 57 (46.7%) patients sustained injury due to fall from height and was the commonest cause of trauma in this study followed by road traffic accident which was 38 (31.1%), 15 (12.3%) had physical assault and similar number of 6 patients (4.9%) sustained injury due to gunshot injury and stab injury. Out of 122 patients, 34 (27.9%) patients had associated injury. The most common chest injury was pneumothorax followed by isolated multiple rib fracture, hemothorax, isolated single rib fracture hemopneumothorax, flail chest, subcutaneous emphysema, lung contusion, open pneumothorax and tension pneumothorax. **Conclusion:** Majority of chest trauma patients were young adults with male preponderance. Blunt trauma chest was most common chest injury. Pneumothorax was the most common chest injury. Majority of patients were managed with tube thoracostomy, analgesics and chest physiotherapy.

Keywords: Chest trauma, hemothorax, pneumothorax, rib fracture

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Introduction

With modernization and the advent of high speed motor vehicles man has started to race with time and along with this we have been facing with an alarming number of road traffic accidents and hence an enormous rise in the number of chest injury patients. It includes injury to chest wall, pleura, tracheobronchial tree, lungs, diaphragm, esophagus, heart & great vessels. It comprises 10-15% of all traumas and 25% of death due to trauma occurs because of chest injury¹. Seventy percent of chest injuries are blunt and remaining is penetrating injury². The civil unrest over the last few years have brought to our hospital a very large number of chest injury patients due to warfare injury ranging from trauma by simple domestic weapons to high speed missiles. On the other hand our hospital still caters to the large number of chest injuries due to fall from height. The chest injury has become a major bulk of the trauma cases presenting at to our centre second to head injury.

Method

All patients of chest injury irrespective of age, sex and mode of injury presenting to BPKIHS emergency were included in this study from 15th March 2007 to 14th March 2008. They were evaluated by a quick primary survey and patients were

resuscitated. Then a detailed history, clinical examination was done and recorded in a predesigned performa. Each patient was subjected to posteroanterior chest x-ray but lateral chest x-ray was done whenever indicated. Blood investigations including complete blood count, RBS, urea and creatinine were done in all patients. USG and CT scan of the chest was done whenever required. ABG was done when indicated. Associated injuries to the other parts of the body were managed & recorded. Managements were in the form Analgesia–Epidural/parenteral, chest physiotherapy, tube thoracostomy or thoracotomy. Outcome of patients was assessed in the following way: Total hospital stay, ICU stay if any, pain assessment by the use of visual analogue scale. Morbidity like pyothorax, pneumonia, bronchopleural fistula, infection at drain site & Mortality were included. A prospective descriptive analysis was done. All the above findings were recorded as per the performa and analyzed by using standard statistical methods (SPSS 11 system).

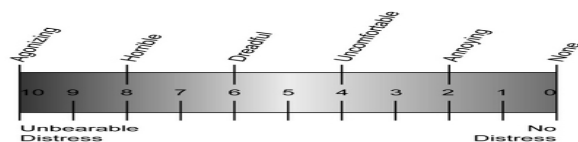


Figure 1: Visual analogue scale

Results

One hundred twenty two patients were

included in this study to know the frequency and pattern of chest injury, clinico-epidemiological profile, treatment and outcome. During the study period total trauma patients presented to emergency were 1524. Out of this 122 patients were of chest injury. It comprises 8% of all trauma patients. All these patients were treated as inpatients. The mean age of the patients was 38.67 +/-15.91 years with range being (3-89) years. Majority of patients belonged to the age group (21-40) years. Sex distribution; 86 (70.5%) patients were male and 36(29.5%) patients were female with ratio of 2.38. Majority of the chest trauma patients were farmers 53(43.4%) followed by students 27 (22.1%), housewife 16 (13.1%), labors 14 (11.5%) and others. Out of 122 patients, 98 (80.3%) patients had blunt trauma chest and 24 (19.7%) had penetrating trauma chest. Patients sustained injury due to fall from height were 57 (46.7%) and was the commonest cause of trauma in this study followed by road traffic accident which was 38 (31.1%), 15 (12.3%) had physical assault and similar number of 6 patients (4.9%) sustained injury due to gunshot injury and stab injury. The commonest symptom was chest pain present in all (100%) patients, followed by cough and shortness of breath. Total number of 15 (12.3%) patients needed immediate resuscitation at emergency due

to unstable vital signs. Chest x-rays showed pneumothorax in 34 patients, hemothorax in 15 patients, and hemopneumothorax in 10 patients. It showed isolated emphysema in 6 patients, lung contusion in three patients & isolated rib fracture in 44 patients. Tension pneumothorax was seen in two patients and flail chest in 6 patients. USG of chest was done in seven patients. ABG was done in ten patients showed respiratory acidosis and managed successfully. CT scan of chest was required in five chest trauma patients during the study. The most common chest injury was pneumothorax followed by isolated multiple rib fracture, hemothorax, isolated single rib fracture hemopneumothorax, flail chest, isolated subcutaneous emphysema, lung contusion, open pneumothorax and tension pneumothorax. Pneumothorax was found in 38 (31.1%) patients & that was commonest type of chest injury. Out of 38 patients, 6 patients had open and 2 patients had tension pneumothorax. Out of 122 patients, 15 (12.3%) patients of hemothorax were found out. Two patients had massive hemothorax. Patients with massive hemothorax were managed with thoracotomy. Hemopneumothorax was noted in 10 (8.2%) patients. Isolated subcutaneous emphysema was found in 6 (4.9%) patients & no any obvious rib fracture was seen in these patients. Lung

contusion was seen in 3 (2.5%) patients. Out of 122 patients, 110 patients had rib fracture & 66 patients had rib fracture associated either with pneumothorax, hemothorax, hemopneumothorax, lung contusion or flail chest. Forty four patients had isolated rib fracture of which 11 had single rib fracture. Four patients had 1st and 2nd rib fracture signify significant trauma to chest. Six patients had flail chest. One patient had body of sternum fracture. Ninety nine patients had multiple rib fracture and 11 patients had single rib fracture. In our study 61 patients were treated with parenteral analgesia using either NSAID or opioid analgesia. Twenty one patients were treated epidural analgesia using sensorcaine or opioids. Forty patients were treated with both epidural analgesia and parenteral analgesia. Mean visual analogue pain score at the time of admission was 8.7 ± 1.2 and mean visual analogue score at the time of

discharge was 2.1 ± 1.3 . Tube thoracostomy was done in 85 (69.7%) & rest without thoracostomy. The mean time of tube removal was 3.8 ± 2.6 days with range being (2-11) days. During our study period two patients underwent thoracotomy for chest trauma in emergency OT. The mean duration of hospital stay was 3.45 ± 3.34 with range being (2-14) days. Ten patients were kept in intensive care unit. Out of 122 patients, 114 patients improved without any morbidity. Four patients developed bronchopulmonary fistula and managed conservatively. Two patients developed empyema thoracic and USG guided aspiration of pus was done. One patient developed pneumonia and later shifted to intensive care unit and managed. One patient of right sided multiple rib fracture with lung contusion later developed ARDS and could not be revived and expired in intensive care unit.

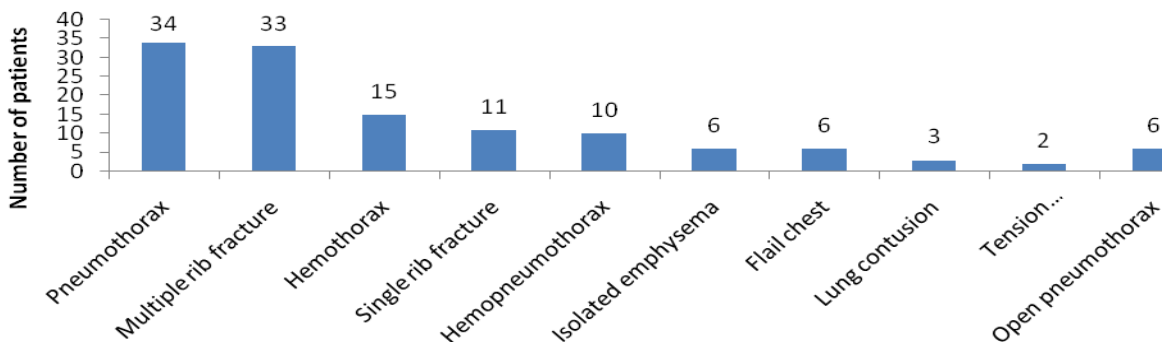


Figure 2: Pattern of chest injury

Discussion

The present study included 122 patients of chest trauma to know the clinico-epidemiological profile, management and outcome. Kul Shrestha et al¹ did a retrospective study "Profile of chest trauma in a level I trauma center" of 1359 patients and found that 964 (70.9%) were male and 395 (29.1%) were females with ratio of 2.44: 1. Out of them 1225 (90.1%) had blunt trauma chest and 134 (9.9%) had penetrating trauma chest. In the same study 48% of patients belonged to the age group of 20- 49 years. In our study, out of 1524 patients, 122 (8.05%) had chest trauma & 86 (70.5%) patients were male and 36 (29.5%) patients were female with M: F ratio of 2.38. In our study, 98 (80.3%) patients had blunt trauma chest and 24 (19.7%) patients had penetrating trauma chest. The mean age of the patients was 38.67 +/-15.91 yrs with range being 3-89 yrs & commonest age group of 21-40 years. Mehmet Sirmali et al² did a retrospective study of 1417 chest trauma patients and found that 548 (38.7%) had rib fracture and 72 patient (18%) had isolated rib fracture. In our study out of 122 patients, 110 (90%) had rib fracture and out of this 44 (36%) patients isolated rib fracture. The magnitude of trauma in our study is less as compared to above study because the study was conducted in metropolitan city of Turkey where the population is high and the traffic is busy and

the study had included two years duration. Raju S Iyer et al³ did retrospective study at Sri Venkateswara Institute of Medical Sciences Andhra Pradesh, India from April 1993 to March 1998. They studied 90 patients of chest injuries and assessed the incidence, presentation and outcome of thoracic trauma. The majorities (55.6%) were less than 40 years of age and 83 patients (92%) were males. Mohita Mehda et al⁴, did a retrospective study of 105 patients over a period of one year and resulted that interval from injury to admission ranged from 1 hour to 24 hour. In our study the mean duration of presentation was 31.67 hours. The late presentation of patients to our hospital might be because of poor transport facility. They were also from the rural and hilly areas, seeking treatment first at health care facility nearby and then being referred to a tertiary health centre. In our study majority of patients were brought without any previous intervention.

Schipper et al⁷, did a study of "Prehospital chest tube thoracostomy: Effective treatment or additional trauma?" University of Rotterdam, Erasmus Medical Center, the Netherlands. The study showed that the infection rate did not differ for tube thoracostomy performed in the prehospital setting or those performed in the emergency. In best of my knowledge and literature search no study has been done in chest trauma in

Nepal. However, few study were done on trauma due to Road Traffic Accident in Nepal. A study done by Jha, N and Agrawal CS¹¹ included a total number of 870 victims of trauma due to RTA.

Conclusion

Chest Injury is a major public health problem. Majority of chest trauma patients were young adults with male preponderance. Blunt trauma chest was most common chest injury. Most common mode of injury was fall followed by road traffic accident. Pneumothorax was the most common chest injury. Majority of patients were managed with tube thoracostomy, analgesics and chest physiotherapy. Chest trauma is prevalent problem, knowledge of its management and potential complications are important.

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