MANAGEMENT OF THORACIC TRAUMA: EXPERIENCE AT AYUB TEACHING HOSPITAL, ABBOTTABAD.

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Background: The incidence of thoracic trauma has rapidly increased in this century of high speed vehicles, violence and various other disasters. It has been observed that chest intubation was required in more than 75% of patients. **Methods:** This prospective study was performed in cardiothoracic surgery unit of Ayub Teaching Hospital Abbottabad from Jun 2007 to Dec 2007. A total of 114 consecutive patients with chest trauma were included in the study, their patterns of injuries classified, treatment strategies and outcome were recorded on a proforma. **Results:** Out of 114 patients with chest trauma, 76 (66.65%) were having penetrating and 38 (33.33%) had blunt trauma. Haemothorax was detected in 67 (58.77%), Pneumothorax in 23 (20.17%), rib fracture in 11 (15.02%) and diaphragmatic injuries in 4 (3.5%) cases. Overall complication rate was 14%. Wound infection was present in 8 (7.01%) and empyema in 4 (3.5%). Mortality was 2.6%. **Conclusion:** Penetrating chest injuries were more common than blunt injuries and chest intubation with resuscitation was adequate in most of the patients.

Keywords: Chest Trauma, Penetrating chest injuries, chest intubation.

INTRODUCTION

In the 20th century of high-speed travel and violence, chest trauma is occurring with ever increasing frequency. Today, death resulting from thoracic trauma ranks third after cancer and cardiovascular diseases. Despite major developments in the management of trauma, it remains the leading cause of mortality.[1] Trauma of the thorax with injury of the chest wall and/or thoracic organs is encountered in 50–60% of all cases of polytrauma. Besides head injuries, thoracic injuries are the most common cause of fatal outcome in these patients.[2] Thoracic injuries account for 20–25% of deaths due to trauma and contribute to 25–50% of the remaining deaths. Approximately 16,000 deaths per year in the United States alone are attributable to chest trauma[3] but almost all patients who reach hospital alive should survive if managed appropriately. Early recognition and timely treatment of various life threatening injuries, better resuscitative measures, perioperative care and skilful surgical procedures can significantly affect the outcome of these patients.[4,5] Proper assessment of injured patients and indicated interventions like tube thoracostomy is the standard care in these patients.

We receive significant number of patients in our hospital with chest trauma. Therefore we conducted this study to review our experience of managing thoracic trauma.

PATIENTS AND METHODS

This case series study was performed at Ayub Teaching Hospital Abbottabad from Jun 2007 to Dec 2007. A total of 114 consecutive patients of all age groups with chest trauma either blunt or penetrating were included in the study. The patients who were initially managed at other hospitals and referred to this hospital for further management were excluded from the study. All the patients were assessed according to Advanced Trauma Life Support (ATLS) guidelines.

Particular attention was given to tension Pneumothorax, flail chest and cardiac tamponade. Patient management included maintenance of intravenous lines in all patients and adequate ventilation achieved by immediate tube thoracostomy where required after clinical assessment of the patients and x-ray chest was done in stable patients. Chest intubation was performed under local anaesthesia except the paediatric patients, apprehensive patients and where thoracic trauma was associated with other injuries when general anaesthesia was used. Tube thoracostomy was done in the triangle of safety on the effected side and attached with underwater seal bottle. Adequate analgesia was given to all patients. Secondary survey was performed after patients were stabilized. Patients with isolated chest trauma were managed further in cardiothoracic unit and patients with polytrauma were managed in the surgical unit. Chest Tubes were kept for 6–13 days. Criteria for removal of chest tubes were fully expanded lungs and with drainage less than 50 ml for 2–3 consecutive days. Patients with trauma to lower chest were routinely subjected to ultrasound abdomen and other relevant investigations. All information, findings and interventions were recorded on proforma and analyzed using SPSS-12.

RESULTS

Out of 114 patients 98 (85.96%) were male and 16 (14%) were female. The age ranged from 7–55 years with most patients in the range of 21–30 years (Figure-1).

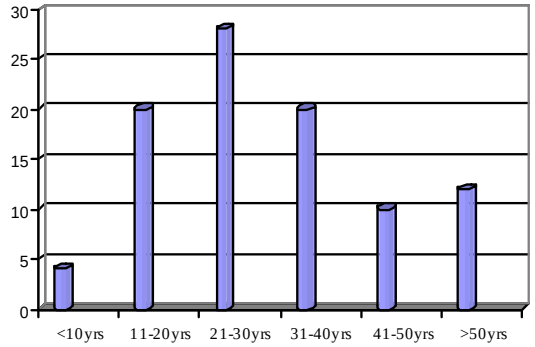

Figure-1: Age distribution

Fifty-four (47.36%) patients had firearm injury and it was the most common presentation (Table-1).

Table-1: Modes of trauma

Mode	Number	Percentage
Firearm	54	47.36
Stab	22	19.29
RTA	24	21.05
Fall	14	12.28
Total	114	100

Different pattern of injuries were observed but Haemothorax was the most common (58.77%) as shown in Table-2.

Table-2: Patterns of chest injuries

Pattern	Number	Percentage
Hemothorax	67	58.77
Pneumothorax	23	20.17
Rib Fracture alone	11	9.64
Hemo & pneumo thorax and rib fracture	5	4.38
Flail Chest	2	1.75
Diaphragmatic injuries	4	3.5
Vascular trauma	2	1.75
Total	114	100

Most of the patients 92 (80.7%) were treated with tube thoracostomy only while 8 (7.01%) patients needed exploratory laparotomy for associated abdominal trauma in addition to chest intubations (Table 4). Gravity dependent drainage was effective in most of the patients and in only 6 patients suction drainage was required for the expansion of the lungs. Among 8 patients who had exploratory laparotomy, three had diaphragmatic tear and liver lacerations due to fire arm injury. Two were suffering from splenic trauma and two had stomach and mesenteric injuries. Diaphragmatic injuries were repaired, stomach perforations were stitched, and liver lacerations were left untouched as there was no active bleeding. One patient had splenectomy and in one spleen was repaired. In 4 patients chest tube dislodged but it was timely re secured. Eight (7.01%) patients developed wound site infections and 4 (3.5%) had empyema. Overall complication rate was 14%. Twelve (10.5%) patients were treated conservatively as they had blunt trauma to the chest and 7 (6.1%) of them were also having rib fracture but there were no feature of respiratory distress. Most of these patients were transfused blood and intravenous (IV) fluid. Nasal oxygen, non-steroid anti-inflammatory drugs, analgesic drugs, antibiotics and mucolytics were given to these patients along with chest physiotherapy.

In four (3.5%) patients thoracotomy was performed for continuous bleeding through chest tube. In two patients intercostal vascular injury was found which was secured with legation. One patient had minor laceration of lung which was repaired and one had severely damaged lung and died on table. Hospital stay was from 8–76 days but prolonged stay was noted in extra thoracic injuries. Death occurred in three (2.6%) patients, one due to lung damage and two due to flail chest.

Table-3: Treatments (n=114)

Intervention	Number (%)
Tube Thoracostomy	92 (80.70%)
Exploratory laparotomy+ Tube Thoracostomy	8 (7.01%)
Thoracotomy	4 (3.5%)
Conservative	10 (8.7%)

DISCUSSION

Chest trauma is one of the most common causes of major injury leading to death.[6] Blunt injuries of the chest result mainly from traffic accidents, while penetrating injuries result from gunshots or stab wounds.[7] Eighty-five percent of our patients were male. Khan[8] in his study reported 95% male patients and Farooq[9] in his series also observed that 90% of his patients were male. We have a male dominant society and mostly male gender is exposed to outside environment which may be the main factor for their increased susceptibility to trauma. Brotzu[10] in his study found that road traffic accident was the most common cause of chest trauma while in our study firearm injury was the most common presentation. Sample size and cultural differences may be the contributory factors. Rib fracture in our series was only 15% while it was 76% in a study done by Hanif *et al*[11] and 44% in study of Farooq[9]. Rib fractures mostly occurs in roadside accident and difference in load of traffic in big and small cities may be the contributing factor for the difference of this finding but frequency of Haemothorax and Pneumothorax was almost similar. Tube thoracostomy is recommended as the initial line of management apart from resuscitation and haemodynamic stabilization.[12,13] In most of cases we performed chest intubation on the basis of clinical assessment of patients and same has been advised by Hishberg *et al*.[14]

Many western studies also recommend that observation or chest tube placement, adequate volume replacement, occasional respiratory support and serial chest X-rays are the only treatment required in 80–85% of the patients.[15] We treated 80% patients with chest

tube only and our results were similar to local[11,16] and international studies[14]. Most studies from a non-military environment continue to support the use of tube thoracostomy as the primary treatment for non-mediastinal chest injury.[17]

In 4 of our patients continuous bleeding after chest intubation was found on thoracotomy. Two of them were bleeding due to intercostals arteries injuries which were secured with legation. Khan MS[16] in his study reported 2 cases with similar observation on thoracotomy. In this era of medical advancement people must not die of salvageable trauma and specially chest trauma because history shows that more than 80% lives can be saved with just chest intubation and supportive measures. Chest intubation requires few instruments, local anaesthesia, and minimally trained but a dedicated doctor. Attention of heath governing authorities can change the scenario.

CONCLUSION

Penetrating chest trauma is more common than blunt trauma in our society. .Morbidity and mortality can be reduced by early diagnosis and timely insertion of chest tube.

RECOMMENDATIONS

Basic education in chest trauma management should be provided to all physicians who might be involved in emergency treatment. A fundamental understanding of the underlying pathophysiological mechanisms and the rational choice of appropriate measures should be delivered during undergraduate medical education.

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