



AN OBSERVATIONAL STUDY ON CLINICAL FEATURES, MANAGEMENT AND OUTCOMES OF CHEST TRAUMA

Dr. Meena*	Post Graduate, Department of General surgery, Government General Hospital, Kurnool Medical College, Kurnool. *Corresponding Author
Dr. Tamil Selvan	Post Graduate, Department of General surgery, Government General Hospital, Kurnool Medical College, Kurnool.
Dr.R.Ramakrishna Naik	Professor, MS, Department of General surgery, Government General Hospital, Kurnool Medical College, Kurnool.
Dr. Y. Sharada	Assistant Professor, MS, Department of General surgery, Government General Hospital, Kurnool Medical College, Kurnool.
Dr.L.Parvathi	Assistant Professor, MS, Mch, Department of General surgery, Government General Hospital, Kurnool Medical College, Kurnool.

ABSTRACT **Introduction**-Trauma is one of the leading causes of death worldwide. Approximately two thirds of trauma cases have chest injuries with varying severity. Mortality is second highest after head injuries, which underlines the importance of prompt diagnosis and treatment. **Methods**-An observational prospective study was carried out for chest trauma patients including polytrauma. Parameters like demographic profile, mode of injury, management and outcomes were studied. **Results**-Mean age of the patients was 38.5 years with male to female ratio of 2.4:1. RTAs are most common cause of trauma (60%) followed by assaults (34%). Many patients were managed conservatively (58%), others needed tube thoracostomy (42%). Mortality is seen in 5% due to other associated severe injuries. **Conclusion**-Blunt thoracic trauma is frequent but emergency open surgical interventions are rare. Mortality is directly related to severity of injury. There is need for implementation of evidence based road safety interventions and promote strong policies to decrease the incidence of RTAs.

KEYWORDS :

INTRODUCTION-

Trauma continues to be a major public health problem worldwide as it is associated with high morbidity and mortality in both developed and developing countries. According to Global Burden of disease 2004 update by WHO, Road traffic accidents constitute ninth leading cause of death among all ages⁴. Chest injuries contribute to around 10% of total trauma related deaths and 15% of loss of disability adjusted life years (DALYs) and they are second leading cause of death in paediatric trauma⁵. Blunt chest trauma represents one of the most common injuries in polytrauma patients prolonging their stay in intensive care units. Chest injuries can potentially pose a threat to the airway, breathing and circulation in traumatised patient thus directly affecting the clinical course and outcome. However, a majority of patients can be managed with intercostal chest tube drainage, appropriate analgesia, physiotherapy and respiratory support. Data regarding magnitude of chest injuries along with its complications is limited. This study was done to analyse the management and outcomes of chest injuries.

METHODS-

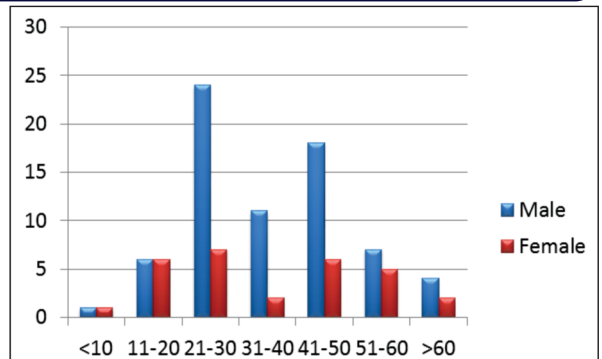
The study was carried out in Government General Hospital, Kurnool, a tertiary care centre. All the trauma patients presented to casualty with chest injuries, both isolated and polytrauma cases, were included in the study. This is a prospective observational study carried out for two years (2019-20) with a sample size of 100 patients.

Data is collected and analysed for demographic profile, mode of injury, types of chest injuries, management and outcome.

Statistical analysis using ANOVA test was done for univariate analysis. Chi-square test was used for comparison. A p value of <0.05 was considered significant. Microsoft excel worksheet was used to calculate mean and standard deviation. Nominal data was presented as percentage.

RESULTS-

A total of 100 patients' data was included in study who presented to casualty with chest injuries for a period of 2 years. Out of 100 patients majority of them belonged to age group 21-30 years followed by 41-50 years. The mean age of males and females was 37 and 39 years respectively. Overall mean age was 38.5 years. The male to female ratio was 2.4:1 (Fig 1).



Most common mode of injury observed in this study is due to road traffic accidents (60%) followed by assaults (34%). Other modes were less common (Table 1). Majority of patients had blunt trauma chest and only 6% had penetrating trauma.

Table 1: Mode of injury

Mode of injury	Male	Female	Total
Road traffic accidents	42	18	60
Assaults	21	13	34
Fall from height	4	2	6

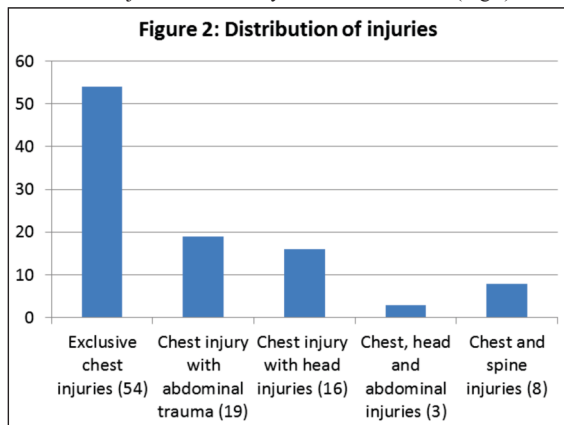
Chest pain and dyspnoea were most common symptoms at presentation whereas chest tenderness, subcutaneous emphysema, bone crepitations were most common findings on physical examination. Multiple injuries are noted in many cases, like abrasions with rib fractures; in cases of penetrating trauma lacerations with pulmonary contusions are seen. One case of right sided chest wall avulsion with exposed lung was seen which was managed with closure of avulsed flap and intercostal chest tube drainage (Table 2).

Table 2: Types of injuries

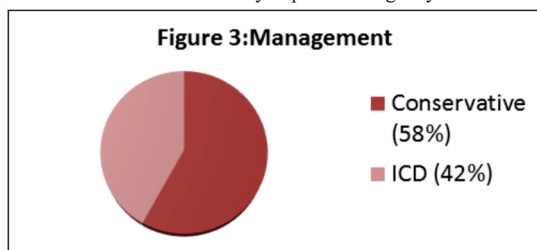
Types of injuries	No. Of cases
Abrasions	70
Lacerations	10
Contusions	12
Fractured ribs	68

Fractured clavicle	11
Flial chest	4
Pulmonary contusions	6
Pulmonary lacerations	1
Pneumothorax	16
Hemothorax	30
Avulsion of chest wall	1
Diaphragmatic injury	1

Many patients had associated head, spine or abdominal injuries. Isolated chest injuries were mostly seen in assault cases (Fig 2).



Most of the cases were managed conservatively(58%). However those with rib fractures, hemothorax, pneumothorax, penetrating injuries, flial chest required intercostal chest tube drainage(42%)(Fig 3). Cases with multiple bilateral rib fractures were seen which required bilateral ICD. Suturing of lacerations in layers was done in cases of penetrating injuries. None of the cases in study required emergency thoracotomy.



Mortality is seen in 5% cases mainly due to associated head injuries. Most cases(82%) are discharged satisfactorily after prompt management. Others were referred to specialities like neurosurgery for head and spine injury management. Some to cardiothoracic vascular surgery department for pulmonary compromise due to secondary infections after ICD insertion. Also to orthopaedic department for extremity injury management.(Table 3).

Table 3: Outcome

Outcome	Percentage
Discharged	82%
Referred	13%
Expired	5%

DISCUSSION-

Thorax is one vital constituent of human body containing most crucial organs and major vessels protected by an efficient armor of thoracic cage. Trauma to thorax is one entity that has a broad spectrum of clinical presentation ranging from simple injuries to life threatening conditions. It is important in emergency department to check for chest injuries in all sorts of trauma cases, especially in alcohol intoxicated and polytrauma cases. Sometimes immediate interventions are life saving in thoracic injuries. The illusion of “first investigate and make diagnosis then treat illness” doesnot hold good in emergency trauma cases. Both diagnosis and therapy should go hand in hand. It is very important to know the clinical features of chest injuries, diagnose them at appropriate timing and simple interventions like tube thoracostomy would save the life of patient.

However in present study major injuries to thorax like pulmonary / cardiac / great vessel / esophageal / tracheal and bronchial injuries

requiring emergency thoracotomy were not encountered. But cases with pneumothorax and hemothorax causing hypoxia were noticed. Immediate letting out of air/ blood from pleural cavity, proper ventilatory support and analgesia saved many patients. One case of diaphragmatic injury with herniation of stomach into left pleural cavity was encountered for which emergency exploratory laparotomy and repair of diaphragmatic injury with left ICD insertion was done. This patient also had pancreatic injury and later developed pancreaticopleural fistula which was managed accordingly and was discharged.

Most patients presenting with subcutaneous emphysema definitely had airway injury and associated rib fractures. Bone crepitations, absent or decreased air entry to lungs on auscultation with decreased saturations are key findings to identify chest injuries. Polytrauma with head injury and alcohol intoxication with unstable vitals to investigate patient pose a major challenge for diagnosis of thoracic or abdominal injuries. It has been given in literature that for a patient who is not responding to resuscitation and if chest injury is suspected, tube thoracostomy could be both diagnostic and therapeutic intervention¹⁰. Extremity trauma with chest injuries is not uncommon so chest has to be examined for sure even in extremity injuries.

In many cases mode of injury and external injuries lead to diagnosis of particular organ to be injured. For example, spine injuries were observed to be more common in fall from heights. In this study, chest injuries were observed to be more common in road traffic accidents. Prompt measures for implementation of laws strictly, like penalty and punishment for drunk and driven cases; also for improvement of road safety and proper driving protocols should be taken. Another common mode being assault is totally avoidable etiology. Overall trauma is mostly preventable with proper safe lifestyle. However accidents could not be prevented completely as to err is in human nature.

Mortality in present study due to chest injury per se is not observed. Expired cases were those with polytrauma having severe head injuries. Chest physiotherapy, incentive spirometry, antibiotics and analgesia are mainstay of conservative management. Stable patients managed conservatively should undergo repeat chest xray after 48 to 72 hours as some pulmonary compromising conditions may have delayed presentations. There are no proper guidelines for discharge of chest injury patients and studies are necessary to formulate proper guidelines for assessing management and discharge of chest injury patients.

The results of present study are not statistically significant as p value is not <0.05. Similar results were obtained in study by Bhupinder singh walia et al .

CONCLUSION-

Young males are found to be affected more commonly to trauma. As for chest injuries mostly conservative management and ICD insertion are mainstay of treatment. Severe injuries to chest leading to major organ or great vessel injuries leading to emergency thoracotomy are uncommon. Significant steps to prevent road traffic injuries and counselling sessions for younger adults involved in assaults are necessary to decrease the incidence of traumatic chest injuries.

REFERENCES-

- [1] Bhupinder Singh Walia, Pankaj Dugg and Sanjeev Sharma, “Clinical features, Management, and Outcomes of Chest Trauma at a Tertiary care centre in India: A Retrospective Observational Study. *The scientific world journal* volume 2021, Article ID 8052586.
- [2] Corinna Ludwig, Aris Koryllos, “Management of chest trauma”, *Journal of Thoracic trauma* 2017;9(Suppl 3): S172-S177.
- [3] Kumar Chandra Kant , Kumar Shashi Kant , Md Noman, “A study to evaluate the Clinic-etiological profile and Management of patients with trauma to chest in a Tertiary care Hospital” *European Journal of Molecular and Clinical Medicine*, vol.7,no.8,2020.
- [4] The Global burden of disease:2004 update, World Health Organisation.
- [5] Umar Farooq , Waqas Raza, Naem Zia, Mohammad Hanif and Mohammad Mussadiq Khan, “Classification and Management of Chest Trauma” *JCPSP* 2006, Vol.16(2):101-103.
- [6] S.T.Liman et al., “Chest injury due to blunt trauma” *European Journal of Cardio-thoracic surgery* 23 (2003) 374-378.
- [7] Mortality due to road injuries in the states of india: The global burden of disease study 1990-2017. *Lancet public health* 2020;5:e86-98.
- [8] Veysi T. Veysi et al., “Prevalence of chest trauma, associated injuries and mortality: a level 1 trauma centre experience” *International Orthopaedics (SICOT)* (2009) 33:1425-1433.
- [9] Rajasekhar Narayan et al., “An Analysis of Presentation, Pattern and Outcome of Chest Trauma Patients at an Urban Level 1 Trauma Center” *Indian j surg*(February 2018) 80(1):36-41.
- [10] W.Glinz., “Chest trauma Diagnosis and Management” Springer-Verlag Berlin Heidelberg New York 1981.