



General Surgery

A STUDY ON VARIOUS CLINICAL PRESENTATIONS AND OUTCOMES IN PATIENTS OF CHEST INJURY ATTENDING TEERTHANKER MAHAVEER MEDICAL COLLEGE AND RESEARCH CENTRE

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ABSTRACT

Introduction: Trauma is a major cause of mortality worldwide. This study is aimed at the patterns of chest trauma, presentation and outcome of management. Thoracic injuries are the third most common injuries in trauma patients. Chest trauma is a major public health problem in India. The present study was carried out to determine the epidemiological profile of chest trauma cases and to analyse the management strategies. Objective: To study various clinical presentations and outcomes in patients of chest injury attending TMMC&RC. Methods: This was a Descriptive Observational study for a period of 18 months on 49 patients who had chest trauma and were admitted in TMMC&RC. **Result:** Most common age group was 41-50 years with male preponderance. More the latent period (the time interval between injury and admission) less chance of survival. Most of the cases were of blunt trauma presented with painful breathing, tachypnoea, subcutaneous emphysema with most common mode of injury was RTA with rib fracture and injury to lungs with bony injury. Maximum patients had good outcome. **Conclusion:** Chest injuries are major problems should be corrected as they are identified. Do not delay treatment to obtain radiologic confirmation. Most patients arriving at the hospital survived, requiring general resuscitation or simple tube thoracostomy with few complications. However, creation of dedicated trauma teams with well-designed management protocols in hospitals can further improve the outcome. The outcome and prognosis for the majority of patients of blunt chest trauma are excellent.

KEYWORDS : Chest trauma, RTA, ICD, Rib Fracture

INTRODUCTION:

A prevalence of 37% of patients visiting emergency departments (EDs) were injured as a result of traumatic events. Thoracic injuries are often the third most common form of traumatic injury among trauma patients, following head and extremity injuries. Thoracic trauma has an overall death rate of 15-25%, with cardiovascular or tracheobronchial-oesophageal injuries having the greatest rates.^[1] Among the other potential complications that may arise from thoracic trauma, pneumonia, respiratory failure, and pleural sepsis are likely the most prevalent. All major consequences are strongly connected to the sternness of the injury and the patient's overall state before injury.^[2] Although there are measures within the control of surgical team which may substantially lessen the criteria of these complication. The prevalence of tension pneumothorax (TPT) varies by population and is not well documented. Often, disease suspicion rather than genuine incidence is reflected. TPT is more frequent in ventilated patients if a simple pneumothorax diagnosis is prolonged. TPT appears to be more problematic in ventilated patients, with 91% fatality rates in one series. The preponderance of life-threatening thoracic injury can be treated with airway control or chest decompression using a needle, finger, or tube.^[3] Patients of chest trauma have been growing globally, as is the total prevalence of polytrauma. The chest, also known as the thoracic cavity, is located in the centre of the physique and is prone to harm in most every mishap that caused the upper part or lower body parts. These wounds can vary from modest knocks and grazes to serious humiliating and lethal piercing trauma. Polytrauma is acknowledged as a significant public health issue. It is, in reality, the largest cause of disability and mortality in the initial four decades of life, and the third leading cause overall. About 25% of all instances of trauma involve separated chest injuries or polytrauma. Better economic growth, combined with an increase in the usage of fast-moving autos, is the major reason of polytrauma. Arms are widely accessible, and passion crimes are increasing as society changes. All of these variables are to blame for the rise of polytrauma. A rib fracture is the more common type of blunt thoracic injury. Other ailments for example flail chest, lung contusion, pneumothorax, and Hemothorax are usually associated with it. The outcome of thoracic injury is determined by the doctor understanding the thermodynamics of the incident, the immediacy of the findings, and the capacity to evaluate and succeed all of the variable involved. The right attitude to the patients will have a positive result on the long-term result. Thoracic cage houses the maximum critical structures - heart, lungs, and major artery, vein - and it must protect the vital organs while also preserving the unique function of lung volume to enable optimal blood oxygenation. Though

the ribs, sternum, and vertebral column that make up this powerful but malleable rib cage provide adequate protection, there are different weak place in this construction such as intercostal gaps, rib angles, and costochondral junctions. These parts are more vulnerable to injury. Because the chest is an exposed area and is more prone to be traumatised in most impacted injuries. Ribs Fracture: The probability of broken ribs directly relates to the severity of a chest injury. 10% is the sum mortality rate for individuals with rib fractures who are admitted to the hospital, however this rises with each subsequent rib fractured, nearing 45% if >7 ribs are damaged.

MATERIALS AND METHODS :

Source of data: Patients who had chest trauma and were admitted in Teerthanker Mahaveer Medical College & Research Centre, Moradabad as per inclusion and exclusion criteria..

Study type: Descriptive Observational study

Period of study: 18 months

Total number of participants: 49

INCLUSION CRITERIA: All patients presenting with history of chest injuries to Emergency Department of Teerthanker Mahaveer Medical College and Research Centre.

EXCLUSION CRITERIA: Paediatric age group (less than 18 years), Poly-trauma (Spinal injury, Brain injury, Pelvic injury), Patients not willing to participate in study.

METHODOLOGY: CRC and IEC approval taken and subject included in study satisfying inclusion criteria after getting written and informed consent.

RESULTS:

Table 1

Clinical Features	No. of Cases, N=49	Percentage
Painful breathing	32	65.3
Cough	1	2.0
Haemoptysis	1	2.0
Tachypnoea	19	38.8
Cyanosis	0	0.0
Subcutaneous Emphysema	24	48.9
Features of shock	4	8.2

Table 1 represents the frequency distribution of Clinical Features. 32 subjects had Painful breathing i.e. 65.3%, 1 subjects had Cough i.e. 2.0%, 1 subject had Haemoptysis i.e. 2.0%, 19 subjects had Tachypnoea i.e. 38.8%, none i.e. 0 subject had Cyanosis i.e. 0.0%, 24 subjects had Subcutaneous Emphysema i.e. 48.9% and 4 subjects had Features of shock i.e. 8.2%.

Table 2

Outcomes of the patients	No. of Cases, N=49	Percentage	
Lungs expanded	43	87.8	
Pneumonia	15	30.6	
Atelectasis	5	10.2	
Empyema	1	2.0	
Need of O2 inhalation	34	69.4	
Mechanical Ventilation	6	12.2	
ICD tube insertion	32	65.3	
Spirometry results	Good	43	87.8
	Bad	6	12.2
Outcomes	Good	42	85.7
	Bad	7	14.3

Table 2 represents the frequency distribution of Outcomes of the patients. where 43 subjects Lungs expanded i.e. 87.8%, 15 subjects had Pneumonia i.e. 30.6%, 5 subjects had Atelactasis i.e. 10.2%, 1 subject had Empyema i.e. 2.0%, 34 subjects had Need of O2 inhalation i.e. 69.4%, 6 subjects were put on Mechanical Ventilation i.e. 12.2%, 32 subjects needed ICD tube insertion i.e. 65.3%, 43 subjects had Good Spirometry results i.e. 87.8% and 6 subjects had Bad Spirometry results i.e. 12.2% and in Outcomes 42 subjects Good outcomes i.e. 85.7% and 7 subjects had Bad outcomes i.e. 14.3%.

Table 3 represents Comparison among latent period with Outcomes.

Outcomes	Latent Period (time interval b/w injury and admission)				P-Value
	<24 hours, n (%)	24-48 hours, n (%)	48-72 hours, n (%)	>72 hours, n (%)	
Bad	1(3.1)	2(25)	2(33.3)	2(66.7)	0.006
Good	31(96.9)	6(75)	4(66.7)	1(33.3)	
Total	32(100)	8(100)	6(100)	3(100)	

Table 7

Used Fisher Exact Test**

Above Table shows the Comparison among latent period interval with Outcomes in terms of mode of injury. It was significant because P-value (<0.05).

DISCUSSION:

Some of the prevalent reasons of clinic admittances, debilities, fatalities, plus social economic loss are chest trauma. Its prevalence is rapidly increasing worldwide as a result of modern civilization. This incidence of chest trauma in our study was found to be 15.25%. Similar incidence were observed in study of Kumar et al.^[5] The risks associated with modern civilization can be attributed to this rising incidence of poor planning and development. In our study, chest trauma cases had an average age of 41.55. Kant et al^[6] found that patients with chest trauma had mean age of 36.3 years. Identical observation of average age (38.56) was observed by Potey et al.^[4] The most prevailing group affected in our study was 41-50 years (26.5%) followed by >50 years (24.5%). In contrast to our study, the commonly affected group in the study done by Potey et al^[4] was the young generation (48%) who frequently engage in vehicular experimental activity (such as over-speeding, etc.) while also constituting important pillars of the country's economy, so an rise in incidences will have a significant impact on the nation. The age range of 20-30 years had the highest proportion of patients, according to Ibrahim et al.^[7] and as people aged, there were fewer cases. With a male to female ratio of 41:8, the male population in our study is most frequently affected. It was similar to the study conducted by Liman et al^[8] who observed that male patients (70.6%) were more commonly affected than female patients (29.4%). Male to

female ratio in Kant et al^[6] and Ekpe et al^[9] studies were 3.54 : 1 and 4 : 1, correspondingly and explanation on behalf of the higher man publics affected in distress may be because most outdoor activities in our country are agreed by men, nevertheless styles are varying then the conclusions in the forthcoming can be unlike. Furthermore, newer age clusters exhibit antagonistic behaviour and engage in risky driving and disputes. The most typical type of trauma is blunt; in our analysis, the ratio of blunt to penetrating injuries was 47:2. Only 0.8% of penetrating trauma cases were observed by Walia et al^[10] and Anisuzzaman et al.^[12] which is consistent with the results of the current study. In current study, highway traffic wounds constituted the greatest prevailing type of hurt (59.2%), followed by assaults (14.3%). This may be explained by the fact that there has been an increase in RTA due to infractions of the law by both drivers and pedestrians, driver fatigue, driving under the influence of alcohol, a lack of streetlights, poor road conditions, urbanisation, an exploding population, and the phenomenal growth of the road transportation industry. According to the National Health Portal, traffic accidents kill five million people worldwide each year. Every year, one million people die in India, and another 20 million are hospitalised as a result of injuries. The National Crime Records Bureau described 413,457 road traffic fatalities in 2015.^[11] Similar to the current study, Kant et al^[6] and Anisuzzaman et al^[12] found that road traffic injuries (63%) were the most common cause of injury, followed by assaults. According to Liman et al^[8] and Mathangasinghe et al^[13] the most common cause of chest trauma is road traffic injuries (67.79%), followed by falls. According to Ibrahim et al.^[7], the most common cause of chest trauma (42%) is assault. They cited elements of local population activity in the vicinity of the hospital as the cause. Household injury, animal attack and industrial accidents contributed minority of cases in our study with 8.2%, 6.1%, and 2.0% cases respectively.

The most prevailing injury in the chest reported in present study is rib fracture (59.2%). The most frequent way that chest injuries are presented is as open chest wall injuries, according to Ibrahim et al^[7] the most prevalent injury mechanism may be a result of assaults. According to Adegboye et al^[14] blunt chest injuries result in flail chest injuries (10.8%), chief but steady trunk wall damages (7.60%), and minor chest wall injury (68%). Number of cases of multiple rib fracture in our study were greater than single rib fracture. Significant results are observed between the lungs expansion and latent period of the study. Maximum cases (96.6%) of lungs expansion is observed within 24 hours. Pneumonia has been developed by chest injury cases (30.6%) in the current research followed by atelectasis (10.2%). 59.4% of the patients required oxygen inhalation within 24 hours of the admission. However need of oxygen inhalation was not strongly associated with the length of the stay. Mechanical ventilation was not needed within 24 hours of the stay. However 66.7% of the cases required it if the stay is longer than 72 hours. ICD tube insertion, Spirometry results and outcomes in terms of mode of injury was found to be strongly associated with the length of the stay. 50% of the cases required ICD tube insertion within 24 hours of the stay. Spirometry results were found to be good within 24 hours of the study. Despite advances in trauma team management, chest trauma remains a significant type of polytrauma. More efforts need to be made to reduce these accidents as well as education programmes for people and physicians to reduce the mortality rate from 10% to 60% and the prevalence of chest trauma remains high.

CONCLUSION:

Chest accidents play a major role in disease and death, particularly in adult man sufferers of transportation injuries. Therefore, in cases of chest injuries, prompt diagnosis and treatment are crucial. Chest trauma is frequently caused by accidents on the road. However, attacks are also becoming a more significant factor in chest trauma. To increase road safety, increase the health system's involvement in addressing traffic injuries, and increase the accessibility of high-quality actionable data, evidence-based interventions are necessary. To meet the Sustainable Development Goal (SDG) target by 2030, a better strategy for targeted interventions is needed. The population of men in age group (41-50) is primarily impacted followed by the older population of age group (>50). The least impacted age group is less than 20 years. Males were more likely than females to sustain chest injuries. Chest trauma frequently has a low mortality rate and is treated conservatively. Compared to penetrating chest trauma, blunt chest trauma occurred more frequently. The most frequent cause of blunt chest trauma is road accidents. Road traffic injuries must be prevented, and younger adults who commit assaults must receive counselling. When managing seriously injured patients, a tube thoracostomy or

thoracotomy is necessary. The most crucial element in treating chest trauma is pain control because it enables early mobilisation and minimises complications from chest injury. Using an epidural analgesic or an intercostal nerve block should be done if necessary to relieve pain.

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