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A study of clinical spectrum and outcome of patients with chest trauma in tertiary care centre

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Abstract

A thorough understanding of clinical spectrum of chest injury, management and its outcomes shall help in better patient management and decrease the mortality and morbidity associated with chest injury. Total of 150 patients with chest trauma reported to casualty, Emergency Department, were included in study. Patients of age group 15-65 years, with no pre-existing cardiopulmonary disease were enrolled in the study. Patients treated on OPD basis and brought dead were excluded from the study. Blunt chest injury was seen in 80.07% and penetrating injury was found in 19.3% of cases. The main reasons for the chest injury were RTA (57.3%), fall from height (16%), assault (22%), industrial injury (2.7%), animal attack (0.7%) and fall of objects on chest (1.3%).

Keywords: Clinical spectrum, outcome of patients, chest trauma, ICD, Hassan

Introduction

Trauma means an injury by external factors. It is a leading cause of mortality and morbidity during first 40 years of life. Trauma to thoracic region has a wide spectrum from chest wall injury to vital organs within the thoracic cavity. Thoracic injuries may be penetrating or blunt and management varies from conservative to invasive. Road accidents, assaults, falls are the major causes of chest trauma. Road Accidents is the leading cause of the chest injury. Across the states, Goa had the maximum share in total road accidents/lakh population in 2015 for the fourth year in a row (222 accidents/lakh persons). This was followed by Kerala (110 accidents/lakh persons), and Tamil Nadu (100 accidents/lakh persons). In terms of accident fatalities, Tamil Nadu had the highest share in 2015 (23 fatalities/lakh persons) followed by Haryana (18 fatalities/lakh persons) and Karnataka (18 fatalities/lakh persons) [1, 2].

A thorough understanding of clinical spectrum of chest injury, management and its outcomes shall help in better patient management and decrease the mortality and morbidity associated with chest injury [3]. Hence, it is important for medical personnel to understand not only the pattern of injury but also the underlying pathophysiology and the outcomes peculiar to their environment [4]. Such study shall help in formulating preventive measures and aid in management of chest trauma patients. Hassan Institute of

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Medical Sciences witness more RTA cases with chest injury. Hence, there is a dire need to conceive studies which can quantify the burden of chest trauma at HIMS, Hassan.
Thereby, a comprehensive study is undertaken to learn the clinical spectrum and the outcome of chest injuries in tertiary care centre. The current study evaluates the various factors responsible for the morbidity and mortality in chest injuries. Total 150 patients with chest injury were studied and their demographic data, pattern of injury, clinical spectrum and outcome were analysed and computed for results.

Materials and Methods

The study was approved by the Institute Ethical Committee, and Institute Research Committee, Hassan Institute of Medical Sciences (HIMS/IRC/30/20). A prospective study was conducted in the Department of General Surgery, HIMS, Hassan, Karnataka. The study was conducted from 1st August 2020 to 31st January 2021. Written informed consent was taken from all the study participants and their accompanying guardian.
Total of 150 patients with chest trauma reported to casualty, Emergency Department, were included in study. Patients of age group 15-65 years, with no pre-existing cardiopulmonary disease were enrolled in the study. Patients treated on OPD basis and brought dead were excluded from the study.
All patents were clinically examined and managed according to the Advanced Trauma Life Support (ATLS) protocol. Radiological investigations such as chest X-ray was done for all patients and CT thorax was done if needed. Routine laboratory investigations were done for all patients. All patients were monitored till their hospital stay to study their survival, mortality and morbidity.

Result and Discussions

The maximum number of chest injury was reported in the age group of 35 to 45 years with the median age as 40 years (Table 1). This group of middle age compromises of 52.7% of patients of chest trauma. The second highest group between 45-55 years covered 22% chest trauma patients. The study shows middle age being more prone to chest injury compared to young age below 35 years comprising of 29.3% of cases. Out of 150 cases, 85.3% cases of chest trauma were males and 14.7% were females. This data suggests that the males are more exposed to external factors leading to chest injury (Table 2).
Blunt chest injury was seen in 80.07% and penetrating injury was found in 19.3% of cases (Table 3). The main reasons for the chest injury were RTA (57.3%), fall from height (16%), assault (22%), industrial injury (2.7%), animal attack (0.7%) and fall of objects on chest (1.3%) (Table 4). This suggests traffic accidents being predominantly commonest cause of chest injury compared to other mechanisms of injury [5]. The patients presented to casualty with history of chest pain (97.33%) and breathlessness (83.33%) and on clinical examination 86.67% had chest wall tenderness with decreased breathe sounds seen in 67.67% and surgical emphysema in 45.33%. (Table 5). This study put forward that the majority of patient with severe chest injury needed emergency surgical intervention. Patients were subjected to routine blood investigations and emergency chest X-Ray. Selective CT-chest scan and USG abdomen was done in patients whom it was needed. Based on above clinical examination and investigations majority of cases presented rib fracture (54.7%), pneumothorax (38.7%), hemothorax (22.7%), hemopneumothorax (17.3%) and lung contusion (17.3%) as common pattern of injury followed by flail chest, sternal fracture, diaphragmatic and cardiac injury (Table 6). Interventional procedure intercostal tube drainage was performed on 68% of the cases while 32% were treated conservatively (Table 7). This suggests the need of intervention was predominant compared to conservative management which included analgesia and rest [6]. In 43.14% patients with ICD, the removal of tube was done after the 8th day of procedure (Table 8). The mean hospital stay was 9 days (Table 9). 46 patients treated conservatively were discharged after recovery. While 102 patients who underwent ICD, 92 patients recovered and latter discharged while 10 of them died (Table 10). Two patients with severe chest injury involving cardiac and diaphragm injury died within few hours of

admission. Associated injury found to be were head injury 34.7%, bony injury 32%, musculoskeletal injury 28.7%, abdominal injury 12% and spinal injury 6% (Table 11).

Table 1: Age wise distribution of patients of chest trauma

Age Group (Years)	Number of Patients (n)	Percentage (%)
15-25	23	15.3
25-35	21	14.0
35-45	79	52.7
45-55	20	13.3
55-65	7	4.7
Total	150	100

Table 2: Gender Distribution

Gender	Number of Patients (n)	Percentage (%)
Male	128	85.3
Female	22	14.7
Total	150	100

Table 3: Type of Chest Trauma

Type of Chest Trauma	Number of Patients (n)	Percentage (%)
Blunt	121	80.7
Penetrating	29	19.3
Total	150	100

Table 4: Mechanism/Etiology of chest injury

Cause	Number of Patients (n)	Percentage (%)
RTA	86	57.3
Fall from Height	24	16.0
Assault	33	22.0
Industrial Accident	4	2.7
Animal Attack	1	0.7
Fall of object on chest	2	1.3
Total	150	100

Table 5: Clinical Features

Clinical Features	Number of Patients (n)	Percentage (%)
Chest Pain	146	97.33
Chest Wall Tenderness	130	86.67
Respiratory Distress	128	85.33
Decreased Breath Sounds	91	60.67
Surgical Emphysema	68	45.33
Hemoptysis	4.0	2.67
Hypotension	28	18.67

Table 6: Pattern of injury

Types of Chest Injury	Number of Patients (n)	Percentage (%)
Rib Fracture	82	54.7
Pneumothorax	58	38.7
Hemothorax	34	22.7
Hemopneumothorax	26	17.3

Lung Contusion	26	17.3
Flail Chest	22	14.7
Fracture Sternum	5	3.3
Diaphragmatic Injury	1	0.7
Cardiac Injury	1	0.7

Table 7: Treatment given to chest trauma patients

Modality of Treatment	Number of Patients (n)	Percentage (%)
Conservative	48	32.0
Tube Thoracostomy/Intercoastal Drainage	102	68.0
Total	150	100

Table 8: Duration of ICD

Duration of ICD (Days)	Number of Patients (n)	Percentage (%)
0 to 4	18	17.65
4 to 8	32	31.37
8 to 12	44	43.14
12 to 16	7	6.86
16 to 20	1	0.98
Total	102	100

Table 9: Hospital Stay

Duration of hospital stay (Days)	Number of Patients (n)	Percentage (%)
0 to 5	19	12.7
5 to 10	80	53.3
10 to 15	43	28.7
15 to 20	8	5.3
Total	150	100.0

Table 10: Outcome of Chest trauma

Outcome	Number of Patients (n)	Percentage (%)
Discharge after conservative treatment	46	30.7
Discharge after ICD	92	61.3
Death due to injury	12	8
Total	150	100

Table 11: Associated Injuries

Associated Injury	Number of Patients (n)	Percentage (%)
Head Injury	52	34.7
Musculoskeletal Injury	43	28.7
Abdominal Injury	18	12.0
Spinal Injury	9	6.0
Bony Injury	48	32.0

Conclusion

Traffic accidents being predominantly commonest cause of chest injury compared to other mechanisms of injury reported at HIMS. The patients presented to casualty with history of chest pain (97.33%) and breathlessness (83.33%) and on clinical examination 86.67% had chest wall tenderness with decreased breathe sounds seen in 67.67% and surgical emphysema in 45.33%. Type of chest injury prevailed was

rib fracture (54.7%) followed by pneumothorax (38.7%). Majority of the chest trauma cases were managed by conservative treatment with analgesia and severe cases responded well to ICD procedure and they were discharged after 5 to 10 days of hospital stay.

References

1. Veysi VT, Nikolaou VS, Paliobeis C, Efstathopoulos N, Giannoudi PV. Prevalence of chest trauma, associated injuries and mortality: A level I trauma centre experience. Int. Orthop. 2009;33: 1425-33.
2. Mommsen P, Zeckey C, Andruszkow H, Weidemann J, Frömke C, Puljic P, *et al*. Comparison of different thoracic trauma scoring systems in regards to prediction of post-traumatic complications and outcome in blunt chest trauma. J Surg. Res. 2012; 176:239-47.
3. Liman ST, Kuzucu A, Tastepe AI, Ulasan GN, Topcu S. Chest injury due to blunt trauma. Eur. J Cardiothorac. Surg. 2003; 23(3):374-8.
4. Afshar MA, Mangeli F, Nakhaei A. Evaluation of injuries caused by penetrating chest traumas in patients referred to the emergency room. Indian J Surg. 2015;77(3):191-4.
5. Al-Koudmani I, Darwish B, Al-Kateb K, Taifour Y. Chest trauma experience over eleven-year period at al-mouassat university teaching hospital-Damascus: A retrospective review of 888 cases. J Cardiothorac Surg. 2012; 7:35.
6. Unsworth A, Curtis K, Asha SE. Treatments for blunt chest trauma and their impact on patient outcomes and health service delivery. Scand J Trauma Resusc. Emerg. Med. 2015;23:17.
7. Dogrul BN, Kiliccalan I, Asci ES, Peker SC. Blunt trauma related chest wall and pulmonary injuries: An overview. Chin J Traumatol. 2020;23(3):125-138.
8. Zreik NH, Francis I, Ray A, Rogers BA, Ricketts DM. Blunt chest trauma: soft tissue injury in the thorax. Br J Hosp Med (Lond). 2016 ;77(2):78-83.
9. Stewart DJ. Blunt chest trauma. J Trauma Nurs. 2014;21(6):282-4
10. Peter SD, Ozoilo KN, Isichei MW, Ale F, Njem JM, Ojo E, Misauno MA, Ugwu BT. Severe Chest Injury Revisited - An Analysis of The Jos University Teaching Hospital Trauma Registry. Niger J Clin Pract. 2021;24(8):1247-1251.

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