

Study of Management and Complications of Thoracic Injuries

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Abstract: Background: The purpose of study is to know incidence of thoracic injuries and pathophysiological changes in relation to trauma and their clinical manifestations. Thoracic injuries result in dramatic physiological abnormalities such as tension pneumothorax, cardiac tamponade and hypovolaemic shock. Methods: The study was carried out in patients of Krishna hospital and Medical research centre, Karad in period of January 1991 to December 1993. We evaluated 250 patients. These cases were studied from time of admission to death or discharge and follow up study was also done. Results: The incidence of thoracic injuries in Krishna hospital is 13.23% In our series 86.0% of cases presented with blunt trauma, while 14% cases presented with penetrating injury. Conclusion: Chest trauma forms major bulk of trauma cases. Blunt thoracic injuries are more common than penetrating injuries. Road traffic accidents cause major bulk of thoracic trauma (60%). Main object of management of thoracic injury is to restore deranged respiratory physiology to normalcy.

Keywords: pathophysiological changes, resuscitation, mechanism of injury

1. Introduction

Chest trauma forms major bulk of trauma cases. The fatal fascination that people have for speed, alcohol, drugs and their propensity for interpersonal conflict has produced an ever increasing number of injured victims. The hallmark of Twentieth century has been tremendous advances in sciences, proliferating industries and finally population explosion. Automobiles are now being made to drive with greater speed, while the protection to either driver or passenger can not possibly match these speeds. With sudden impact the thorax is vulnerable to crushing injury from steering wheel, dash board, or side of car. Various other causes of trauma to chest are stab or gunshot wound, assault with blunt object and blast injuries.

This is somewhat surprising as less than 15% patients with thoracic injury require thoracotomy, the remaining being adequately treated by resuscitative measures, endotracheal intubation and tube thoracostomy.

The surgeon has to be very alert in dealing with these cases which pose a tremendous challenge to his diagnostic and therapeutic skills. Amongst thoracic injuries, crush injuries are the most serious accidents. Lesions produced by run over road accidents are due to compression or crushing. In these cases, external wound may be small or none but internal damage may be life threatening. Hence, one should not come to any conclusion merely by appearance of external wound without proper evaluation of the patient.

Victims of road accidents usually have polytrauma and a team of specialists like Neurosurgeon, Cardio-thoracic surgeon, Orthopaedician, Anaesthesiologist and Radiologist along with trained nursing staff and appropriate supportive measures like availability of adequate blood transfusions, antibiotics, artificial respiratory units, roentgenogram machines, C.T. scan machines are required to treat these patients.

2. Methods

Ethical Statement: The Study made the standards outlining the declaration of Helsinki and Good Epidemiological practices. This study did not change or modify the laboratory of clinical practices of each centre and differences of practices were kept as they are. The data collection was anonymous and identifiable patient information was not submitted. Individual researchers were responsible for complying with local ethical standards and hospital registration of study.

Study Population: The Present study was carried out in patients of Krishna Hospital, and Medical Research Centre, Karad during period of January 1991 to December 1993. We evaluated 250 patients. In our series 86.0% (215) of cases presented with blunt trauma, while 14% (35) cases presented with penetrating injury.

Mechanism of injury:

Chest injuries occur by four principle mechanism:

- Acceleration/deceleration (motor vehicle accident)
- Body compression (crush injury)
- High speed impact (gunshot wound)
- Miscellaneous
 - Low velocity penetration (stab wound)
 - Airway obstruction (suffocation)
 - Caustic injury (poisoning)
 - Burns
 - Electrocution

3. Observations and Results

Table 1: incidence of thoracic injuries

Total no. of accident cases	1889	100.00%
Thoracic injury cases	250	13.23%

We evaluated 250 patients. In our series 86.0% (215) of cases presented with blunt trauma, while 14% (35) cases presented with penetrating injury.

Table 2: Type of injury

No.	Type of Injury	No. of cases	% of cases
1	Blunt Injury	215	86%
2	Penetrating injury	35	14%

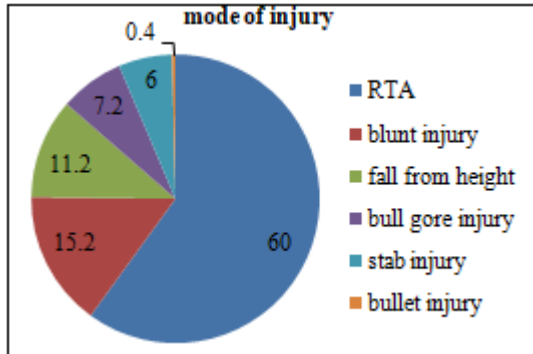


Table 3: Hypotension and mode of injury and fall of body temperature

No.	Type of Injury	Hypotension	Sub normal temperature
1	Blunt Injury	28	14
2	Penetrating injury	14	11

Table 4: time lost before admission to hospital

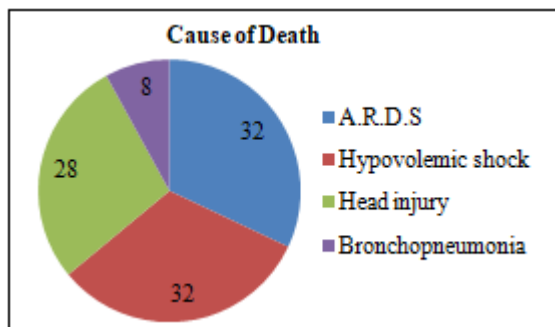
Table lost in hours	No.	Percentage
0-1	71	28.4%
1-2	69	27.6%
2-3	39	15.6%
3-4	15	6.0%
4-6	17	6.8%
6-8	10	4.0%
8hr and more	29	11.6%

Table 5: Fracture ribs and mortality

No. of cases	No. of cases	No. of cases expired	Percentage
Single rib	15	2	13.33%
2-3 ribs	41	6	14.6%
4-6 ribs	37	6	16.2%
7-8 ribs	16	5	31.25%

Table 6: Needle aspiration of pleural cavity

Needle aspiration	No. of cases	+ve	-ve	False -ve
Done	45	18	27	-
Not Done	205	-	-	10



4. Discussion

During the period of study, 1889 cases of accident were admitted in our hospital .Out of these cases 250 (13.23) cases had thoracic injury. According to study, thoracic injuries were classified as

- 1) Blunt injuries
- 2) Penetrating injuries

In our study 215 (86%) cases had blunt thoracic injuries while only 35 (14%) cases had penetrating injury. Chest injury do not have any predilection as far as age or sex is concerned. In our study, 60 % cases were due to motor vehicle accidents, 11.2% cases were due to fall from heights, 6.93% cases were due to stab wounds, 1.65% cases were due to gun shot wounds, 14.19% cases were due to blunt instruments.

Complications as following were noted:

Wound infection, pneumonitis, bronchopneumonia, pleural effusion, empyema, bronchopleural fistula, chylothorax, Adult respiratory distress syndrome, traumatic aortic aneurysm.

Morbidity and mortality:

Mortality in our study was 10%. 25 patients expired out of total 250 patients studied.

Type	No. of cases	No. of deaths	Percentage
Blunt injury	215	22	10.23%
Penetrating injury	35	3	8.57%

5. Conclusion

- 1) Knowledge of physiology of respiration and pathophysiology of chest trauma is essential for proper management of thoracic injuries.
- 2) Chest trauma forms major bulk of trauma cases.
- 3) Blunt thoracic injuries are much more common than penetrating injuries.
- 4) Road traffic accidents cause major bulk of thoracic trauma.
- 5) Multisystem organ involvement is common.
- 6) Main object of management of thoracic injury is to restore deranged respiratory physiology to normalcy.
- 7) Conservative treatment with keen follow up has definite role in management of specific injuries.
- 8) Physiotherapy is of paramount importance in both conservative and surgical management of thoracic injuries.
- 9) Thoraco-abdominal trauma should be carefully observed and requires prompt surgical intervention when required.
- 10) Associated injuries requires equal attention to reduce mortality rate.
- 11) Better transport facilities with properly equipped ambulance and better communication facilities will go long way in improving survival rate of severely traumatised patients.

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