

# Pattern of Chest Injuries in a Tertiary Care Centre in Western U.P.

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## ABSTRACT

**Background:** Chest trauma is a leading cause of morbidity and mortality among all age groups.. This retrospective study has been undertaken to analyse the pattern of chest injuries among patients admitted in a tertiary care centre. **Methods:** All the in-patient records of patients, admitted with abdominal injuries in the emergency department of the Teerthankar Mahaveer Medical College & Research Centre, located in Moradabad (U.P.). **Results:** There were total 139 cases of chest injuries, during the study period. 84 victims were in 2<sup>nd</sup> to 4<sup>th</sup> decades of life, 18 in 5<sup>th</sup> decade, 8 in 1<sup>st</sup> decade and the remaining 19 patients were in either extremes of age groups. The male to female ratio was 2.4:1. There were 111 cases of blunt chest injuries and 28 cases of penetrating injuries. Most common X ray findings were haemothorax, seen in 94 cases followed by pneumothorax in 59 cases and multiple rib fractures in 50 cases. Blunt injuries were caused due to accidents in 102 cases and homicides in 9 cases. Penetrating injuries were caused due to accidents in 15 cases and homicides in 13. The mortality rate was 6.4%. **Conclusion:** Chest Injuries were more common among males than females.

**Keywords:** Chest injuries, Penetrating injuries, Blunt injuries.

## INTRODUCTION

Trauma is a leading cause of morbidity and mortality in today's world. Generally, the people of the most active and productive age groups are involved, which adds a serious economic loss to the community. Chest injuries are very common in cases of trauma. The present study was undertaken to analyse the pattern of chest injuries among patients admitted in a tertiary care centre located on national highway No. 24 with a heavy influx of trauma cases.

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## MATERIALS AND METHODS

All the in-patient records of patients, admitted with chest injuries in the emergency department of the Teerthankar Mahaveer Medical College & Research Centre, located on N.H.24, in Moradabad district of Uttar Pradesh, during the one year period from 1<sup>st</sup> April 2012 to 31<sup>st</sup> March 2013 were analysed retrospectively.

## RESULTS

In all, 367 cases of trauma were admitted to the emergency department of the Teerthankar Mahaveer Medical College & the Research Centre during the study period. Out of them, 139 (37.8%) had chest injuries, either alone or in combination with other body regions [Table 1].

**Table 1: Regions of body involved during chest injuries.**

Single Body Region Involved	No.	%age
Chest	17	12.23
<b>Two Body Regions Involved</b>		
Limbs + Chest	26	18.7
Head + Chest	18	13
Chest + Abdomen	8	5.7
Chest + Spine	5	3.6
Oral & maxillofacial + Chest	4	3
<b>Three Body Regions Involved</b>		
Head + Chest + Limbs	19	13.6
Head + Chest + Abdomen	12	8.6
Chest + Abdomen + Limbs	12	8.6
Head + Oral & maxillofacial + Chest	8	5.7
<b>Four body regions involved</b>		
Head + Chest + Abdomen + Spine	6	4.3
Head + Chest + Abdomen + Limbs	4	3
<b>Total</b>	<b>139</b>	<b>100%</b>

### Age

84 patients were between the 2<sup>nd</sup> to 4<sup>th</sup> decades of life, 18 patients were in 5<sup>th</sup> decade, 8 in 1<sup>st</sup> decade and the remaining 19 patients were in either extremes of age groups [Table 2].

**Table 2: Age Groups.**

Age Group	No.	%age
0-9	8	5.8
10-19	18	13
20-29	34	24.5
30-39	27	19.4
40-49	23	16.5
50-59	18	13
60-69	6	4.3
70-79	3	2.1
>= 80	2	1.4
<b>TOTAL</b>	<b>139</b>	<b>100</b>

**Sex Distribution**

There were 98 males and 41 females, so the male to female ratio was 2.4:1 [Table 3].

**Chest Injuries**

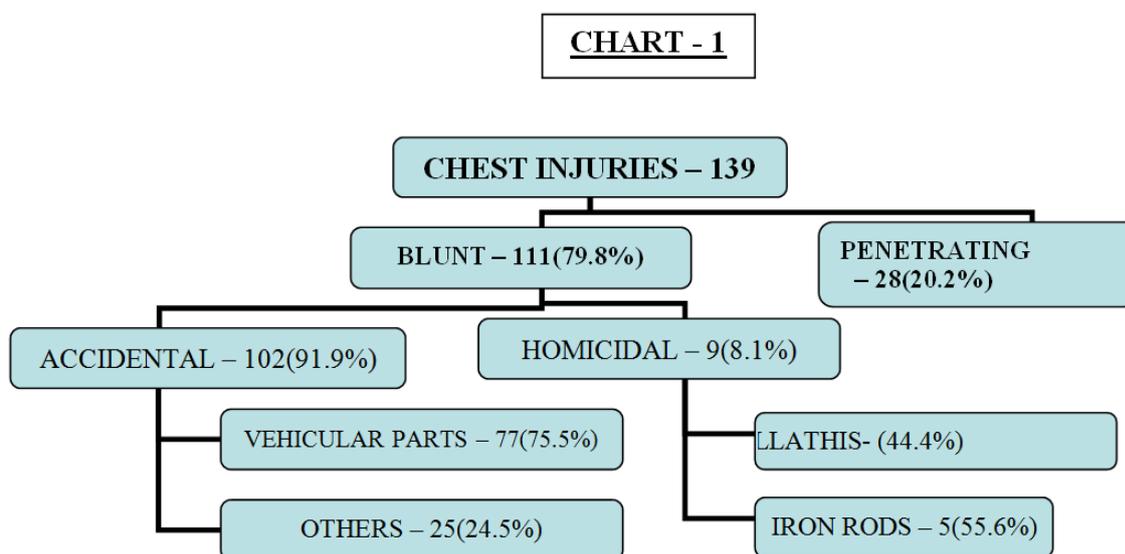
In total 367 cases studied, 37.87% (139) cases were of chest injuries either alone or in combination with

other body regions. Out of 139 cases of chest injuries; blunt injuries accounted for 79.8% (111) and 20.2% (28) of the cases had penetrating injuries [Chart 1].

**Table 3: Sex Distribution.**

Sex distribution	NO.	%
Male	98	70.5
Female	41	29.5
<b>Total</b>	<b>139</b>	<b>100</b>

91.9% (102) of the blunt injuries were accidental and 8.1% (9) were homicidal. Blunt injuries in the accidental group were caused due to impact with various vehicular parts in 75.5% (77) cases and other objects in 24.5% (25). Homicidal blunt injuries were caused by blows from lathi in 44.4% (4) of all such cases and by iron rods in 55.6% (5) cases [Chart 1].



**Chart 1: Chest Injuries.**

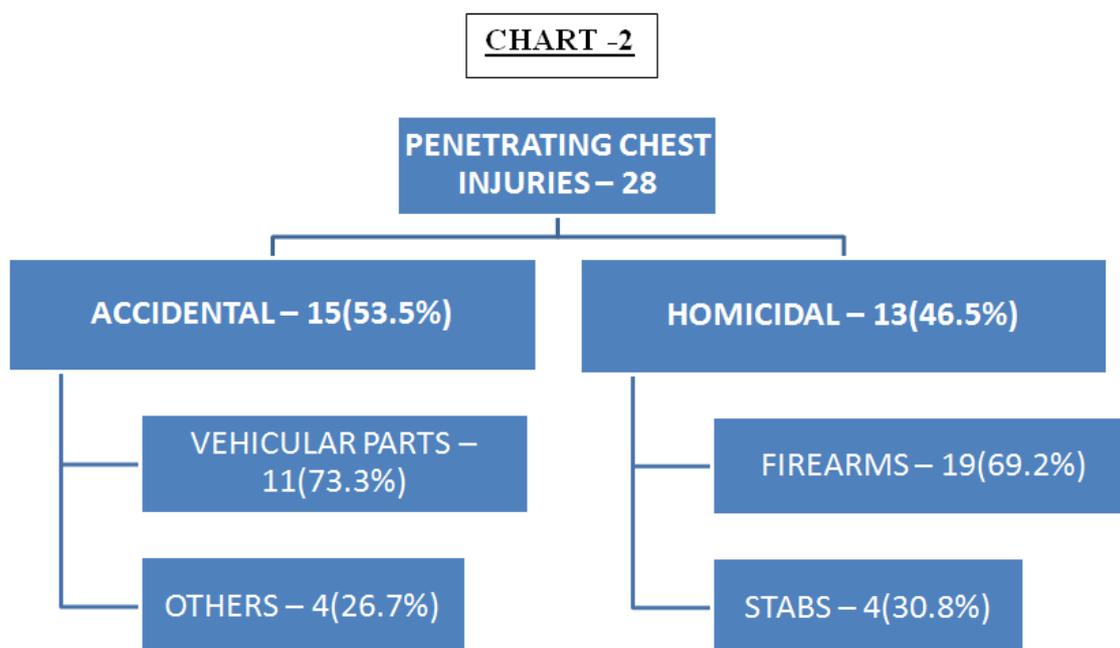
Penetrating injuries in the accidental group comprised 53.5% (15) of all such injuries compared from 46.5% (13) of the penetrating injuries in the homicidal group. Out of all accidental penetrating chest injuries, 73.3% (11) were caused by vehicular parts and 26.7% (4) by various other objects. Such injuries in the homicidal group were caused by firearms in 69.2% (9) out of which 66.9% (6) were due to country made firearms and the remaining 33.1% (3) due to weapons of other makes. Stab injuries constituted 30.8% (4) among all cases of penetrating homicidal chest injuries [Chart 2].

All the cases of chest injuries (139) had single or multiple findings on Chest X Ray. Based on these findings, haemothorax was present in 67.62% (94) cases; pneumothorax was present in 42.44% (59)

cases, multiple rib fractures in 36% (50) cases, single rib fractures in 35.2% (49) and flail chest in 17.26% (24) cases [Table 4].

**Treatment**

All the 139 victims were managed according to the advanced trauma life support protocol. Thoracotomies were done in the in all cases of penetrating injuries and 9 (8.1% cases of blunt injuries) cases of blunt injuries. Patients with haemothorax and or pneumothorax were managed with tube thoracostomies together with other supportive measures. All other patients of blunt trauma, who were haemodynamically stable, were managed conservatively.



**Chart 2: Penetrating Chest Injuries.**

There were total 9 mortalities out of 139 cases, so the mortality rate was 6.4% and all these patients had involvement of four body regions. The rest of the 130 patients responded well to treatment and were discharged in a healthy clinical state.

**Table 4: Chest X-Ray findings.**

Chest X Ray Findings	No.	%Age
HAEMOTHORAX	94	67.62%
PNEUMOTHORAX	59	42.44%
MULTIPLE RIB #	50	36%
SINGLE RIB #	49	35.2%
FLAIL CHEST	24	17.26%
<b>TOTAL</b>	<b>139</b>	<b>100%</b>

## DISCUSSION

Out of 367 cases studied, 139 cases were of chest injuries alone or in combination with other body regions. Out of them, blunt injuries accounted for 79.8% (111) and penetrating injuries, 20.2% (28) [Chart 1].

Monafisha K Lema<sup>[1]</sup>, Blasco E<sup>[2]</sup>, Kuzuku A<sup>[3]</sup>, William F<sup>[4]</sup>, in separate studies have similarly reported a comparatively, much higher incidence of blunt chest injuries in comparison to penetrating injuries. This pattern can be due to the predominance of road traffic accidents among chest trauma victims. The most commonly affected age group in the present study was between 10 to 59 years comprising 86.4% cases. [Table 2] and the majority of patients were males (70.5%) with a male to female ratio of 2.4:1 [Table 3]. Similar demographic patterns have been reported in various other studies on chest trauma as well like those carried out by

Hanafi M<sup>[5]</sup>, Monafisha K Lema<sup>[1]</sup>, Cooper C<sup>[6]</sup>, Ali N<sup>[7]</sup>, Adam AA<sup>[8]</sup>.

These figures clearly suggest that people in the most productive age group are the most common victims. The reason for male predominance is probably because they are more mobile and have much active participation in high risk and aggressive activities.

In our study, 91.9% (102) of the blunt injury cases were accidental and only 8.1% (9) were homicidal. Hanafi M<sup>[5]</sup> have also reported 93% cases of blunt trauma due to accidents.

Blunt injuries in the accidental group were caused due to impact with various vehicular parts in 77 (75.5%) cases and other objects in 25 (24.5%). Homicidal blunt injuries were caused by blows from lathis in 44.4% (4) of all such cases and by iron rods in 55.6% (5) cases [Chart 1].

Penetrating injuries in the accidental group comprised 53.5% (15) of all such injuries compared from 46.5% (13) of the penetrating injuries in the homicidal group. Out of all accidental penetrating chest injuries, 73.3% (11) were caused by vehicular parts and 26.7% (4) by various other objects. Such injuries in the homicidal group were caused by firearms in 69.2% (9) out of which 66.9% (6) were due to country made firearms and the remaining 33.1% (3) due to weapons of other makes. Stab injuries constituted 30.8% (4) among all cases of penetrating homicidal chest injuries [Chart 2].

Our findings differ from those of Thomas MO et al<sup>[9]</sup>, Nigeria, who, in their study on penetrating chest injuries showed that in total, of 168 patients, gunshots caused 60.1% of the injuries while traffic accidents caused 27.3% of the injuries.

The higher incidence of injuries due to road traffic

accidents in our study was probably because of the location of our institute on a highway. The highest incidence of gunshot injuries in Nigeria is because Homicides are very common in Africa.

Hasan M et al<sup>[10]</sup>, in their study on 68 cases of chest trauma reported a predominance of penetrating injuries over blunt injury. Homicidal injury predominated over accidental and incidence was more in rural than in urban areas.

Injuries confined to the chest were seen in 4.63% (17) cases. Chest injuries were associated with those of extremities in 7.08% (26) cases, with head injuries in 4.9% (18), with abdominal injuries in 2.18% (8), with spinal injuries in 1.36% (5) cases and with oral and maxillofacial injuries in 1.09% (4) cases [Table 1].

Chest injuries were also associated with those of the extremities and head in 5.18% (19) cases, with abdominal and head injuries in 3.27% (12), with oral maxillofacial and head injuries in 2.18% (8), with abdominal, spinal and head injuries in 1.63% (6) cases and with head, abdominal and extremity injuries in 1.09% (4) cases [Table 1].

This pattern of associated extra-thoracic injuries is similar to those reported in other studies, like those carried out by Ali N<sup>[7]</sup>, Kalliopi A<sup>[11]</sup>, Inci I<sup>[12]</sup>. These associated injuries significantly increase the overall morbidity and mortalities of the victims.

Thoracotomies were done in the in all cases of penetrating injuries and 9 (8.1% cases of blunt injuries) cases of blunt injuries. Patients with haemothorax and or pneumothorax were managed with tube thoracostomies together with other supportive measures. All other patients of blunt trauma, who were haemodynamically stable, were managed conservatively.

In the study carried out by Hanafi M<sup>[5]</sup> for blunt chest trauma also, thoracotomies were done in 9% cases signifying that most cases of blunt injuries can be managed conservatively.

There were total 9 mortalities out of 139 cases, so the mortality rate was 6.4% and all these patients had involvement of four body regions. The rest of the 130 patients responded well to treatment and were discharged in a healthy clinical state.

## CONCLUSION

1. Out of 367 cases of trauma studied, 37.87% (139) cases were of chest injuries either alone or in combination with other body regions.
2. 84 patients were between the 2<sup>nd</sup> to 4<sup>th</sup> decades of life, 18 patients were in 5<sup>th</sup> decade, 18 in 1<sup>st</sup> decade and the remaining 19 patients were in either extremes of age groups.
3. Males were affected much more commonly than females with the male to female ratio of 2.4:1.
4. Blunt injuries were more common than penetrating injuries as, out of 139 cases, 79.8%

(111) were blunt and 20.2% (28) were penetrating injuries.

5. Accidents were the leading cause of blunt injuries, seen in 91.9% (102) cases. Amongst them, impact with vehicular parts accounted for 75.5% (77) cases while the rest 24.5% (25) cases were due to impact with various other objects.
6. Homicidal blunt injuries were caused by blows from lathis in 44.4% (4) of and by iron rods in 55.6% (5) cases.
7. Penetrating chest injuries were also mostly caused by accidents, seen in 53.5% (15) cases, impact with vehicular parts being the most common mechanism in this group as well, seen in 73.3% (11) cases. Homicides were responsible for 69.2% (9) cases of penetrating injuries out of which 66.9% (6) were due to country made firearms and the remaining 33.1% (3) due to weapons of other makes. Stab injuries constituted 30.8% (4) among all cases of penetrating homicidal chest injuries.
8. Haemothorax was the most common finding, seen in 67.62% (94) cases; pneumothorax was present in 42.44% (59) cases, multiple rib fractures in 36% (50) cases, single rib fractures in 35.2% (49) and flail chest in 17.26% (24) cases
9. There were total 9 mortalities out of 139 cases, so the mortality rate was 6.4% and all these patients had involvement of four body regions.

## REFERENCES

1. Monafisha K Lema, Phillipo L Chalya, Joseph B Mabula and William Mahalu. Pattern and outcome of chest injuries at Bugando Medical Centre in North western Tanzania. *Journal of Cardiothoracic Surgery*. 2011; 6:7
2. Blasco E, Borro JM, Caffarena JM Jr, Galan G, Garcia-Zarza A, Padilla J, Paris E, Pastor J, Peiialver J C, Tarrazona V. Blunt chest injuries in 1696 patients. *Eur J Cardio-thorac. Surg* 1992; 6:284-287.
3. Kuzuku A, Liman ST, Ulasan GN, Tastepe AI, Topai S. Chest injury due to blunt trauma. *European Journal of Cardiothoracic surgery*. 2003; 23:374-378.
4. William F, Anita L, Charlene M. Injury to the chest, complications and management experience at a Level 1 trauma centre. *Am. Journal of Surgery*. 1996; 1-6.
5. Hanafi MI, Al-Sarraf N, Sharaf H, Abdelaziz A. Pattern and presentation of blunt chest trauma among different age groups. *Asian Cardiovasc Thorac Ann*. 2011; 19(1):48-51
6. Cooper C, Militello P. The multiple injured patient: Maryland shock trauma protocol approach. *Thoracic Cardiovasc Surg*. 1992; 4:163.
7. Ali N, Gali BM. Pattern and Management of chest injuries in Maiduguri, Nigeria. *Annals of African Medicine*. 2004; 3:181-184.
8. Adam AA, R Ilagoa R, Mekonen E. Chest Injuries in Tikur Anbessa Hospital, Addis Ababa, Ethiopia: 3- year experience. *East and Central African Journal of Surgery*. 2009;6:11-14.
9. Thomas MO, Ogunleye EO. Penetrating chest trauma in Nigeria, *Asian Cardiovascular and Thoracic Annual*. 2005 Jun; 13(2): 103-6.

10. Hasan M, Hossain MB, Mahmud MM. Evaluation of 68 cases of chest injuries. Mymensingh Medical Journal. 2005 Jul; 14(2):169-74.
11. Kalliopi A, Michalis G, Nikolas T. Management of 150 flail chest injuries: analysis of risk factors affecting outcome. Eur. J Cardiothorac Surg. 2004; 26:373-376.
12. Inci I, Ozçelik I, Tacyildiz O, Nizam N, Eren G, Ozen DB. Penetrating chest injuries: unusually high incidence of high velocity gunshot wounds in civilian practice. World J Surg. 1998; 22:438-442.

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