

## Pattern of abdominal injuries in a tertiary care centre on N.H. 24 in western U.P.

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### INTRODUCTION

Trauma is a leading cause of morbidity and mortality in today's world. Generally, people of the most active and productive age groups are involved which adds a serious economic loss to the community. Abdominal injuries are very common among trauma victims. Proper understanding of the etiology and pattern of such injuries may help in improving the management and final outcome of the patients. The present study has been undertaken with the same objective.

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### IN BRIEF

**Background.** Abdominal trauma is a leading cause of morbidity and mortality among all age groups.. This retrospective study has been undertaken to analyse the pattern of abdominal trauma with respect to epidemiology, etiology and visceral injuries. **Methods.** All the in-patient records of patients, who were admitted with abdominal trauma in the emergency department of Teerthankar Mahaveer Medical College & Research Centre, located on N.H.24, during the period from 1<sup>st</sup> November 2009 to 30<sup>th</sup> October 2010 were analysed. **Results:** Total 87 cases of abdominal trauma, with or without involvement of other body regions were studied. 51 victims were in 2<sup>nd</sup> to 4<sup>th</sup> decades of life, 12 in 5<sup>th</sup> decade, 11 in 1<sup>st</sup> decade and the remaining 12 patients were in either extremes of age groups. The male to female ratio was 3.3:1. Blunt injuries were more common than penetrating injuries with 61 blunt injuries and 26 cases of penetrating injuries. Accidents were the leading cause of both blunt and penetrating abdominal injuries. Most commonly injured viscus in cases of blunt trauma was bowel, and in cases of penetrating injuries was spleen. The mortality rate was 4.6%.

**Key words:** Abdominal Trauma, Penetrating Trauma, Blunt Trauma

### MATERIALS AND METHODS

All the in-patient records of patients, who were admitted with abdominal trauma in the emergency department of Teerthankar Mahaveer Medical College & Research Centre, a tertiary care centre, located on N.H.24, during the period from 1<sup>st</sup> November 2009 to 30<sup>th</sup> October 2010 were analysed retrospectively.

### RESULTS

Total 367 trauma victims were brought in the emergency department of Teerthankar

Mahaveer Medical College & Research Centre during 1 year period from 1<sup>st</sup> November 2009 to 30<sup>th</sup> October 2010. Out of them, 87 (23.7%) had abdominal injuries either alone or in combination with other body regions.(Table - 1).

**Table 1: Body regions involved**

Body region involved	No.	%age
Abdomen alone	20	23
<b>Two body regions involved</b>		
Abdomen + Limbs	15	17.24
Abdomen + Chest	8	9.2
Abdomen + Spine	7	8.04
Abdomen + Head	3	3.44
<b>Three body regions involved</b>		
Abdomen+Chest+Head	12	13.8
Abdomen+Chest+Limbs	12	13.8
<b>Four body regions involved</b>		
Abdomen+Chest+Head+Spine	6	6.89
Abdomen+Chest+Head+Limbs	4	4.59
<b>Total</b>	<b>87</b>	<b>100%</b>

#### AGE

51 patients were in 2<sup>nd</sup> to 4<sup>th</sup> decades of life, 12 patients were in 5<sup>th</sup> decade, 11 in 1<sup>st</sup> decade and the remaining 12 patients were in either extremes of age groups.(Table-2).

**Table 2: Age groups**

Age group	No.	%age
0-9	5	5.7
10-19	11	12.6
20-29	22	25.3
30-39	15	17.2
40-49	14	16
50-59	12	13.8
60-69	5	6
70-79	2	2.3
>= 80	1	1.1
<b>Total</b>	<b>87</b>	<b>100</b>

**SEX DISTRIBUTION**

67 patients were males and 20 females, so male to female ratio was 3.3:1 (Table-3).

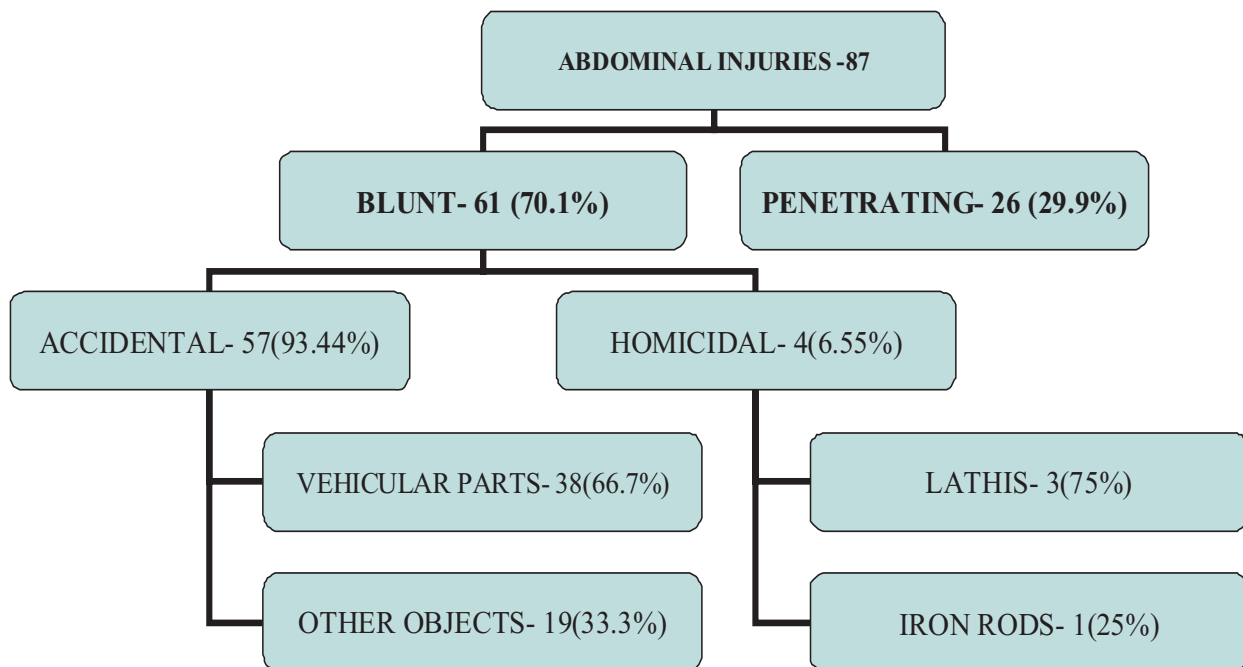
**Table 3: sex distribution**

Sex distribution	No.	%
Male	67	77
Female	20	23
Total	87	100

**TYPES OF ABDOMINAL INJURIES**

Out of 87 patients of abdominal trauma, 61 had blunt injuries, and 26 had penetrating injuries. (Chart-1).

**Chart- 1**



**BLUNT ABDOMINAL INJURIES**

Blunt abdominal injuries were accidental in 57 cases and homicidal in 4.

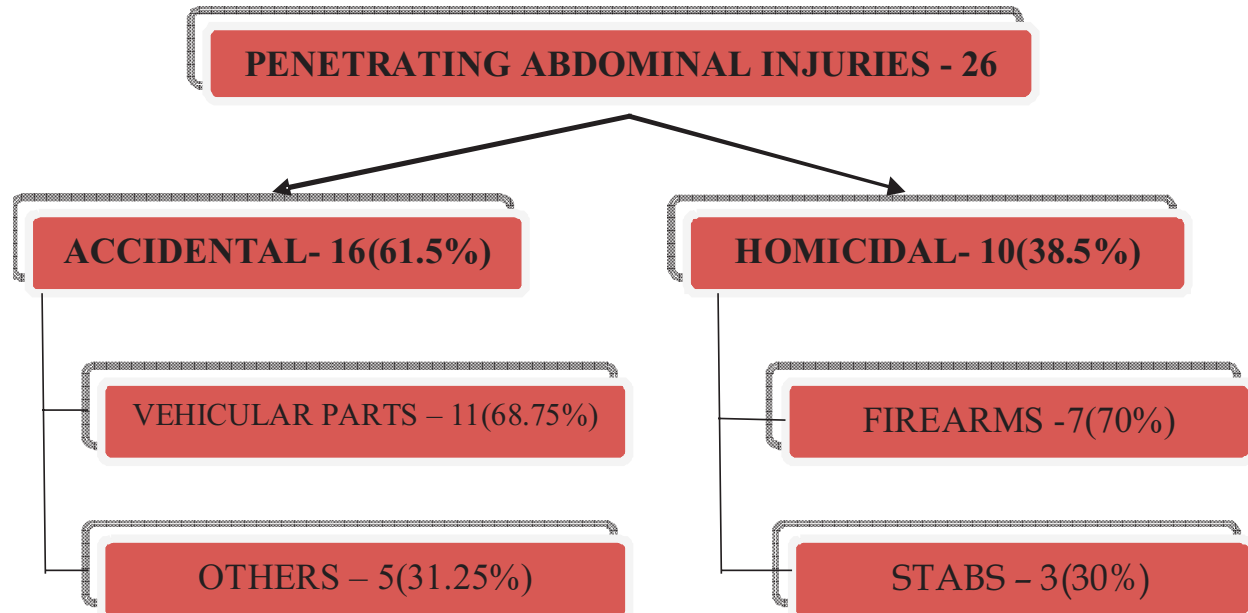
Accidental blunt injuries were caused due to impact with various vehicular parts in 38 cases and by other hard objects in 19 cases. Homicidal blunt injuries were caused by blows from lathis in 3 and by iron rods in 1 case. (Chart-1).

**PENETRATING ABDOMINAL INJURIES**

There were total 26 cases of penetrating abdominal injuries out of which 16 were accidental and 10 homicidal. Accidental injuries were caused by vehicular parts in 11 cases and by other objects in 5 cases. Homicidal penetrating injuries were caused by firearms in 7 cases out of which, 5 were by country made firearms and the remaining 2 by firearms of

other makes. Stab injuries were responsible for 3 cases. (Chart-2).

Chart 2



#### PATTERN OF VISCERAL INJURIES

Out of all the 87 cases studied, 7 patients of blunt abdominal trauma did not have any visceral injury as deduced on clinical examination and investigations like Ultrasound, CT scan and X- Rays. Rest of the 80 patients had either single or multiple visceral injuries.

Among the 61 patients of blunt trauma, bowel was the most commonly injured viscus, involved in 43 cases, mesenteric injuries were the second most common, encountered in 32 cases. Other viscera involved, in decreasing order of frequency were, spleen, liver and kidney. (Table-4a)

Table 4a: Blunt trauma- visceral injuries

Organs involved	No. of cases	%age
Bowel	43	70.5%
Mesentry	32	52.4%
Spleen	28	46%
Liver	21	34.4%
Kidney	7	11.4%

There were 16 cases of pelvic fractures out of which 6 also had extraperitoneal rupture of urinary bladder, 4 had associated rupture of the membranous urethra, 4 had extraperitoneal rupture of the urinary bladder with rupture of the membranous urethra and 2 cases had pelvic fractures alone. (Table-4b)

Table 4b: Blunt trauma- pelvic fractures

PELVIC fractures:	No. of cases
With Urinary Bladder Injuries (Extra peritoneal)	6
With Urethral Injuries (Membranous Urethra)	4
With Urinary Bladder and Urethral Injuries Combined	4
Isolated	2
<b>Total</b>	<b>16</b>

Among the victims with penetrating abdominal injuries, spleen was the most commonly injured viscus found in 18 cases, followed by liver in 12 cases. Mesentry, kidney and bowel were the other less commonly involved viscera. (Table-5)

**Table 5: Penetrating abdominal injuries**

Organs involved	No. of cases	% age
Spleen	18	69.2%
Liver	12	46.1%
Mesentry	8	30.7%
Kidney	6	23%
Bowel	5	19.2%

### TREATMENT

All the 87 victims were managed according to the advanced trauma life support protocol. 7 patients of blunt trauma, who had no visceral injuries, as deduced on clinical examination and investigations and were haemodynamically stable, were managed conservatively. Laparotomies were done in the remaining 54 cases of blunt abdominal trauma and in all the 21 cases of penetrating injuries.

There were total 4 mortalities out of 87 cases, so the mortality rate was 4.6% and all these patients had involvement of four body regions. Rest of the 83 patients responded well to treatment and were discharged in a healthy clinical state.

### DISCUSSION

In the present study, 58.6% (51) patients were in 2<sup>nd</sup> to 4<sup>th</sup> decades of life, 13.8% in 5<sup>th</sup> decade, 12.6% in 1<sup>st</sup> decade and the remaining

15.1% patients were in either extremes of age groups.(Table-2) . Upto 84% (73) cases were due to accidents.

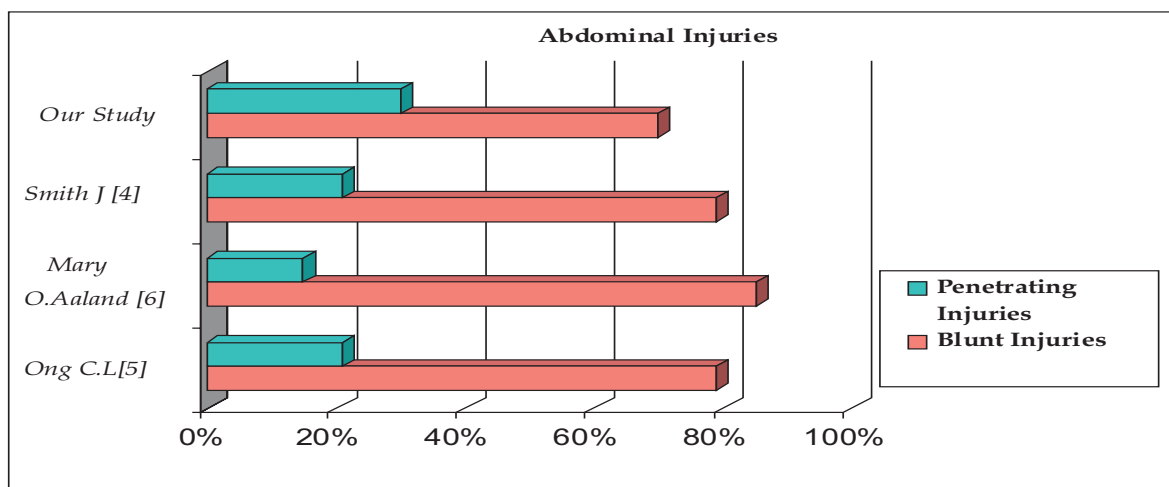
Various other studies on accidental trauma have also reported maximum incidence of such injuries in 20 to 39 years age group ranging from 53.9% to 75%. [1,2,3]

Showing that people of the most active and productive age group are involved in accidental injuries which adds a serious economic loss to the community.

Males were affected more frequently than females with a male to female ratio of 3.3:1(Table-3)

Blunt abdominal injuries were much more common than penetrating injuries as, out of 87 cases, 70.1% (61) were blunt, and 29.9% (26) were penetrating injuries.(Chart-2) Smith J et al [4] and Ong CL [5], in separate studies have also reported 79% incidence of blunt injuries while Mary O Aland and Ken Smith [6] have reported upto 85% incidence of such injuries.(Fig.1)

**Fig.1**



Accidents were the leading cause of blunt abdominal injuries, seen in 93.4% (57) cases, impact with vehicular parts being responsible for the majority 66.7% (38) of such injuries. Homicides were responsible for the remaining 6.5% (4) cases, mostly inflicted by lathi blows. (Chart-1) Frank C et al [7], in their case series of 518 patients of blunt abdominal trauma have also reported similar findings

Penetrating abdominal injuries were also mostly accidental, seen in 61.5% (16) cases, impact with vehicular parts being the most common mechanism in this group as well, seen in 68.75% (11) cases. Homicides were responsible for 38.5% (10) of penetrating injuries, caused by firearms in 70% (7) cases, out of which, 5 were country made firearms and the remaining 2 were firearms of other makes. (Chart-2) Deodhar Sd et al [8] however, have reported homicides as a cause of penetrating abdominal injuries in upto 96% cases in their series.

Smith J et al [4] reported accidental injuries in 68% cases and homicidal injuries in 24% the cases.

The high percentage of accidental injuries in the present study were because of the high proportion of road traffic accidents which may be because of poor traffic sense and non compliance of traffic rules compared to the study of Smith J et al [4], which was conducted in Australia where traffic rules are strictly followed and non compliance leads to heavy penalties.

Among the homicidal penetrating injuries in our study, 70% were due to firearms. This may be due to the easy availability of such weapons because of illegal trafficking, non-licensed users and the overall declining law and order situation coupled with highly aggressive behavior of the general population.

Out of 87 cases, 7 patients of blunt trauma did not have any visceral injury as deduced on clinical examination and investigations like Ultrasound, CT scan and X-Ray. Rest of the 80 patients had either single or multiple visceral injuries.

Bowel was the most commonly injured viscus in cases of blunt trauma, involved in

70.5% (43) cases. This is in contrast to the findings of other studies, which have reported spleen as the most frequently injured viscus in cases of blunt abdominal trauma. [7,9,10]

Other viscera involved, in decreasing order of frequency were mesentery, spleen, liver and kidney. (Table-4a) There were 16 cases of pelvic fractures most commonly associated with extraperitoneal rupture of the urinary bladder. (Table-4b) This association of urinary bladder injuries with pelvic fractures have also been reported by Shalu et al [11] & Olinde HDH [12].

Among the victims with penetrating abdominal injuries, spleen was the most commonly involved viscus found in 69.2% (18) cases. Other viscera involved, in decreasing order of frequency were liver, mesentery, kidney and bowel. (Table-5)

Most of the patients in this study had either single or two body regions involved (Table-1). In all, 4 patients, with involvement of four body regions, succumbed to their injuries hence the mortality rate was 4.6%. Rest of the 83 patients responded well to treatment and were discharged in a healthy clinical state.

So, APACHE II score proved to be a reliable indicator of injury severity and outcome of patients in our study.

## CONCLUSIONS

1. Out of 367 trauma victims brought in the emergency department of Teerthankar Mahaveer Medical College during the 1 year study period 87 (23.7%) had abdominal injuries either alone or in combination with other body regions.

2. 58.6% (51) victims in 2<sup>nd</sup> to 4<sup>th</sup> decades of life, 13.8% in 5<sup>th</sup> decade, 12.6% in 1<sup>st</sup> decade and the remaining 15.1% patients were in either extremes of age groups.

3. Males were much more commonly affected than females with the male to female ratio of 3.3:1.

4. Blunt abdominal injuries were more common than penetrating injuries as, out of



87 cases, 70.1% (61) were blunt, and 29.9% (26) were penetrating injuries.

5. Accidents were the leading cause of blunt abdominal injuries, seen in 93.4% (57) cases, with vehicular accidents being responsible for 66.7% (38) of such injuries. Homicides were responsible for the remaining 6.5% (4) cases, mostly inflicted by lathi blows.

6. Penetrating abdominal injuries were also mostly accidental, seen in 61.5% (16) cases, impact with vehicular parts being the most common mechanism in this group as well, seen in 68.75% (11) cases. Homicides were responsible for 38.5% (10) of penetrating injuries.

7. Bowel was the most commonly injured viscus in cases of blunt trauma while spleen was most commonly involved organ in penetrating abdominal injuries.

8. In all, 4 patients, with involvement of four body regions, succumbed to their injuries hence, the mortality rate was 4.6%.

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