

# A Clinico-Epidemiological Study of Blunt Trauma Abdomen in a Tertiary Care Centre in Eastern UP

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## Abstract

**Aim:** The aim of study was to recognize the common modes, identify the incidence and epidemiology and to assess short term outcome of various treatment modalities of blunt trauma abdomen in a tertiary care centre in Eastern UP.

**Material & Methods:** A “Prospective observational study of blunt trauma abdomen in a Tertiary Care Centre” which was conducted in the Department of General Surgery of BRD Medical College Gorakhpur. The study included all patients who were admitted and operated, during period of 1 year. 80 patients were included in the study.

**Results:** Blunt abdominal trauma was more common in 21-30 years of age and 82% belonged to 11-50 years of age thus affecting the working population. There was a male preponderance with 85% cases being men and a male: female ratio of 5:1. Road traffic accidents were the commonest cause of blunt abdominal trauma accounting for 65%. Pain was the commonest symptom present in 96% cases and tenderness with guarding was the commonest sign present in 98% cases. On inspection 47.5% has abrasion on abdomen due to impact of blunt force. 32.5 % also had contusion along with abrasion due to greater impact on abdomen. 57 % had guarding and 32% had tenderness. On percussion 46.2 % had normal tympanic note and were managed conservatively. 53.8% had dull note either because of hemorrhage or contamination after perforation. On auscultation bowel sound was absent in 52.5% of patients mainly because of ileus due to impact of trauma, or hemoperitoneum.

**Conclusion:** With proper history, thorough clinical examination and use of common radiological investigations, diagnosis of intra-abdominal visceral injuries in patients of Blunt Abdominal Trauma could be made with significant accuracy.

**Keywords:** Tertiary care, Trauma, Blunt Injuries Abdomen, Clinico Epidemiological Study.

## 1. INTRODUCTION

Trauma has been called the neglected disease of modern society, despite its close companionship with man. Trauma is the leading cause of death and disability in developing

countries and the most common cause of death under 45 years of age.<sup>1</sup> World over injury is the 7th cause of mortality and abdomen is the third most common injured organ. Abdominal injuries require surgery in about 25% of cases. 85% of abdominal traumas are of blunt character.<sup>2</sup> The spleen and liver are the most commonly injured organs as a result of blunt trauma. Blunt abdominal injuries are usually not obvious clinically in very early stage and are frequently unreliable. In view of increasing number of vehicles, consequent increase in road traffic accidents, rampant increase in construction works, accidental fall from height do occur. Apart from this the detection of intra-abdominal injuries poses a diagnostic dilemma if patient had suffered a poly-trauma. Diagnosis requires intelligent interpretation of history, the physical finding and results of available radiological investigation. Various diagnostic modalities have been studied in great detail regarding how they help in the initial management of patients with blunt trauma abdomen (BTA).

In the non-invasive tests category, the role of computed tomography (CT), Ultra-sonography (USG) and focused abdominal sonography for trauma (FAST) scans are already established.<sup>3</sup> With clinical examination, computed tomography (CT) abdomen are very beneficial to detect those patients with minimal and clinically undetectable signs of abdominal injury and are the part of recent management guidelines. Approach to trauma should be systemic and prioritized. About 10% of patients have persistent hypovolemic shock as a result of continuous blood loss in spite of aggressive fluid resuscitation and require an urgent laparotomy. Damage control laparotomy is a lifesaving procedure for such patients with life-threatening injuries and to control hemorrhage and sepsis. On the other spectrum, there has been increasing trend towards non operative management (NOM) of blunt trauma amounting to 80% of the cases with failure rates of 2-3%.<sup>3</sup> non operative management (NOM) is a standard protocol for hemodynamically stable solid organ injuries.

In view of increasing number road traffic accidents, and Blunt trauma abdomen this study has been chosen to study the cases of blunt abdominal trauma presenting in BRD Medical College, Gorakhpur. Pre-hospital transportation, initial assessment, thorough resuscitative measures and correct diagnosis are of utmost importance in trauma management.

## **2. MATERIAL & METHODS**

A Prospective observational study of blunt trauma abdomen in a Tertiary Care Centre which was conducted in the Department of General Surgery of BRD Medical College Gorakhpur. The study included all patients who were admitted and operated, during period of 1 year. 80 patients were included in the study.

### **Inclusion Criteria**

- All Patients with blunt abdominal trauma
- Patients of all age groups.

### **Exclusion Criteria**

- Associated With Severe Head Injury
- Associated With Severe Chest Injury
- Pregnant females
- Penetrating injury abdomen

### **Methodology**

According to the ATLS protocol patients was resuscitated that is airway, breathing, circulation, disability was managed. In all cases, an appropriate primary survey of the patients was done. A detailed history, especially history with particular reference to mode of injury

was taken with information provided by the patient, relatives of the patient and witnesses of accidents.

Detailed history included time elapsed since injury, presenting symptoms especially abdominal and history of allergies, medications, past medical history, last meal or oral intake and events leading to presentation. Resuscitation was continued concomitantly according to the ATLS protocol while a detailed physical examination was done for identification of all injuries. Detailed physical examination was mainstay to identify patients who required urgent laparotomy from those who can be observed safely, investigated to clinch a diagnosis and plan further management. Detailed physical examination was included primary survey (general condition of the patient, pulse rate, blood pressure, respiration, hydration, pallor/cyanosis) and systemic examination.

Conventional radiology (chest x-ray, abdominal x-rays erect/decubitus) and supine along with emergency investigations such as haemoglobin (Hb) total leukocyte count (TLC), random blood sugar (RBS) blood urea, serum creatinine, blood grouping and cross match, electrocardiogram (ECG) was done.

### 3. RESULTS

Table 1: Demographic details

Variables	N	%
<b>Age Group (in years)</b>		
<10	2	2.5
11-20	17	21.25
21-30	21	26.25
31-40	13	16.25
41-50	15	18.75
51-60	8	10
>60	4	5
<b>Gender</b>		
Male	68	85
Female	12	15
<b>Mechanism of injury</b>		
Assault	14	17.5
Fall from Height	14	17.5
RTA	52	65
<b>Complaint</b>		
Pain in Abdomen	77	96.25
Vomiting	25	31.25
Nausea	3	3.75
Obstipation	50	62.5
Respiratory Distress	12	15

Blunt abdominal trauma was more common in 21-30 years of age and 82% belonged to 11-50 years of age thus affecting the working population. There was a male preponderance with 85% cases being men and a male: female ratio of 5:1. Road traffic accidents were the commonest cause of blunt abdominal trauma accounting for 65%. Pain was the commonest symptom present in 96% cases and tenderness with guarding was the commonest sign present in 98% cases.

Table 2: Inspection, palpation, percussion and auscultation among study subjects

Variables	N	%
<b>Inspection</b>		
Abrasion	38	47.5
Laceration	1	1.25
Lump	2	2.5
Abrasion with Contusion	26	32.5
Abrasion with Laceration	1	1.25
Abrasion with Contusion & Laceration	3	3.75
<b>Palpation</b>		
Tenderness	26	32.5
Guarding	47	57.75
Lump	10	1
<b>Percussion</b>		
Dull	43	53.8
Tympanic	37	46.2
<b>Auscultation</b>		
Present	38	47.5
Absent	42	52.5

On inspection 47.5% has abrasion on abdomen due to impact of blunt force. 32.5 % also had contusion along with abrasion due to greater impact on abdomen. 57 % had guarding and 32% had tenderness. On percussion 46.2 % had normal tympanic note and were managed conservatively. 53.8% had dull note either because of hemorrhage or contamination after perforation. On auscultation bowel sound was absent in 52.5% of patients mainly because of ileus due to impact of trauma, or hemoperitoneum.

Table 3: Management and outcome

Variables	N	%
<b>Management</b>		
Conservative	37	46.2
Operative	43	53.8
<b>Outcome</b>		
Discharge	68	85.1
Discharge on request	9	11.3
Expired	1	1.3
Abscond	2	2.5

46.2% were conservatively managed and 53.8% were operated upon. The mortality rate was just 1.3% in our study due to quick interventions and resuscitation done. The patient who expired was a patient who was in a gasping on presentation with a saturation of 76% on room air, Blood pressure 60/40, PR 150. The patient was resuscitated according to ALTS protocol but expired within an hour of presentation.

Table 4: Distribution of the study subjects according to organ damage

Organ Damage	N	%
Ileum	6	7.5
Liver	26	32.5
Omentum	3	3.75
Mesentery	39	48.75
Jejunum	8	10
Small Intestine	6	7.5
Spleen	17	21.25
Omental Tear	1	1.25

Liver was the most common injured organ involving 32.5% patients. Spleen was 2nd most commonly injured organ in our study. Jejunum (10%) was the most commonly injured hollow viscus and rest of small intestine was involved in 7.5%, Out of 26 who had liver injury 23 were managed conservatively, 3 had grade IV liver injury and were referred to higher centre, 10 had grade 1 liver disease 5 had grade 2 liver injury 5 had grade 3 liver injury. Out of 17 splenic injury 10 were managed by splenectomy as the spleen was transected, 7 were managed conservatively.

#### 4. DISCUSSION

Trauma is rapidly emerging as a modern epidemic. Blunt trauma continues to be the most common mechanism of injury to abdomen. Incidence of BTA is variable from time to time depending on circumstances, mode of injury. Abdomen injuries are seen in 2-5% of all RTA and are leading injuries in 51.6% of fatal accidents.<sup>3</sup> Hence, abdominal trauma makes trauma as one of the leading causes of acute abdomen in the day-to-day surgical practice. It accounts for the majority (80%) of abdominal injuries seen in emergency department, and is responsible for substantial morbidity and mortality.

In our study majority of patients belonged to 21-30 age group which is similar to the results obtained in study by N. Mehta et al.<sup>6</sup> In the study done by Kondreddy S et al<sup>7</sup> and Sreenidhi et al<sup>8</sup>, people in 11-20 years of age were most commonly involved which is the second commonest age group in our study. 82% belonged to 11-50 years of age. The mean age in our study was 33. The mean age in our study was 33. It can be said that most of the victims belonged to young and reproductive age group Males are more affected in blunt abdominal trauma. 85% were males in our study and 79% in N. Mehta et al<sup>6</sup> study and 79.4% in Fazili et al<sup>9</sup> study. Ratio of males to females was 4:1. In all the studies road traffic accident was the commonest etiology. It caused blunt abdominal trauma in 65% patients in our study and in 53% patients in N. Mehta et al<sup>6</sup> study. This is due to modernisation and increase in automobile usage and increase in rash driving along with people indulging in drinking alcohol and driving Prevention of road traffic accidents can significantly reduce the incidence of blunt abdominal trauma. This is followed by fall from height (18%) which is comparable to that obtained in Fazili et al study (28.4%).<sup>9</sup>

Pain was the commonest symptom in our series present in 96.25% cases while it was present in 92.9% in N.Mehta et al study.<sup>6</sup> Mohapatra et al<sup>10</sup> also reported pain abdomen in 77% cases. Davis et al<sup>4</sup> reported in their study that tenderness and guarding present in 75% cases. Solid organ injury was more common than hollow viscus injury, liver being the commonest among solid organs and small intestine being common among hollow viscus injuries. This result was inconsistent with study done by Agarwal V K et al<sup>11</sup> where the most common organ injured were solid visceral organ 70%. Liver was the most common organ injured. Similar results

was seen in study done by Trehan V et al<sup>12</sup> who showed liver 34.2% as the most common organ involved followed by spleen in 22.51% cases.

In 48.75 % patient's mesentric tear was present which required operative intervention. Multiple organ injuries were seen in 18% patients which emphasis the need to look for other injuries when a single injury has been visualized. In our study 30% patients did not have any intra-abdominal organ injuries. X-Ray and CECT abdomen were the two main investigations in our study. X-Ray was performed in all patients because they were simple, quick, available 24 hour and could be performed quickly after resuscitation. X-Ray was more helpful in identifying hollow viscus injuries having a sensitivity of 85.7%. Mohapatra et al<sup>10</sup> also reported accuracy of X-ray erect abdomen to be 100% in detecting hollow Viscus perforations. USG (FAST) done in 34 cases of which 24(73.5%) patients have positive results while in 10 patients equivocal result found.

CECT was not done in patients with hollow viscus injuries in whom diagnosis was already made and those with solid organ injuries who were haemodynamically unstable. CECT is time-consuming, requires good renal function and a stable patient. Hence it may be reserved for equivocal cases when absence of intra-abdominal injury cannot be ruled out. Though it is a second line investigation it was more helpful in detecting grade I injuries and gave necessary information for deciding the mode of management especially in Stable patients. 53.8% patients were managed by doing exploratory laparotomy out of which 25% had perforation in hollow viscus and rest had solid organ injury. 46.2 % were managed conservatively after doing a CECT abdomen in them. Kailidou et al<sup>13</sup> (2005) also used CT scan to assist in defining treatment. The mortality rate was just 1.3% in our study due to quick interventions and resuscitation done. 85.1% were discharged without any complications while 11.3% were discharged earlier on request of patient. Study by Davis et al<sup>4</sup> showed 15% mortality with septicemia, which was similar as in our study.

## 5. CONCLUSION

Measures for early transport of the patients from the accident site to the trauma centres should be undertaken. Significant number of cases will have associated injuries with blunt injury abdomen like head injury, thoracic injury, extremity fractures. Clinical presentation is varying, Erect abdomen X ray is a useful investigation to identify associated hollow viscus injury. CECT forms the core investigation of choice in dealing with blunt injury abdomen patients, and becomes more important in deciding operative versus conservative management. Early diagnosis and repeated clinical examination and use of appropriate investigations form the key in managing BTA injuries.

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