

## **Risk Factors Leading to Blunt Abdomen Trauma Along with Its Study In Different Organ Injuries**

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### **Abstract**

**Introduction:** India is one of the leading countries when it comes to death due to road accidents. Road traffic accidents have become a public hazard nowadays leading to one of the largest threats to human lives. Abdomen is the most commonly injured part of the body and most of these traumas are of blunt character. Blunt abdominal trauma (BAT) is a frequent emergency and is associated with significant morbidity and mortality in spite of improved recognition, diagnosis and management.

**Method:** The study was conducted at a tertiary hospital after obtaining approval from the Ethical committee from Jan 2021 to June 2022. The sample size taken for this study was 92 patients. All patients of either gender

presenting to the general surgery Opd with a history of blunt abdomen injury were included in the study. A detailed history of patients was taken with regard to symptoms, their duration and severity, drug history, and bleeding disorders. History of alcohol and smoking, radiation and blood transfusion was collected. Thorough general physical and systemic examinations were performed.

**Results:** Mode of injury showed that the majority of patients had road traffic accidents followed by H/O falls and blunt trauma. The majority of patients had abdominal pain followed by abdominal distension. The distribution of patients according to management showed that the majority of patients were managed by operation followed by conservative management.

**Conclusion:** The present study concludes that road traffic accidents were the most common cause of blunt abdominal trauma in this study.

**Keywords:** Abdomen, blunt, trauma, organ, road accidents.

### **Introduction**

Countries across the world are going through major urbanisation, motorisation, industrialisation and alteration in socioeconomic values. India is no different to this changing trend. Due to these changes, road traffic accidents have become the most important public hazard in the world, resulting in one of the largest threats to human lives and safety. India is the leading country in the number of deaths due to road traffic accidents.<sup>1</sup> Abdomen is the third most commonly injured part of the body and 85% of abdominal traumas are of Blunt character. Blunt abdominal trauma (BAT) is a frequent emergency and is associated with significant morbidity and mortality in spite of improved recognition, diagnosis and management. Trauma is the second largest cause of disease accounting for 16% of the global burden. Motor vehicle accidents account for 75 to 80% of Blunt abdominal trauma. Blunt injury of the abdomen can also result from industrial mishaps, the result of a fall from height, assault with blunt objects and sports injuries.<sup>2</sup> The care of the trauma patient is demanding and requires dedication, diligence, and efficiency. Evaluating patients who have sustained Blunt abdomen trauma remains one of the most challenging and intensive aspects of acute trauma care.<sup>3</sup>

The spleen and liver are the most commonly injured organs as a result of Blunt trauma. Missed intra-abdominal injuries and concealed haemorrhages are frequent causes of increased morbidity and mortality, especially in patients who survive the initial phase of an

injury.<sup>4</sup> Physical examination findings are sometimes unreliable for several reasons; including the presence of distracting injuries, associated chest injuries, an altered mental state and co-existing drug and alcohol intoxication in the patient.<sup>3</sup> Initial resuscitation along with Focused assessment with sonography in trauma (FAST) and computed tomography (CT) abdomen are very beneficial to detect those patients with minimal and clinically undetectable signs of an abdominal injury and are part of recent management guidelines. Approach to Blunt abdominal trauma should be systematic and prioritised.<sup>4</sup>

Therefore, the present study was done to study the risk factors leading to blunt abdomen trauma for different organ injuries.

### **Materials & Methods**

The study was conducted at a tertiary care hospital after obtaining approval from the Ethical committee. It was a Prospective observational study. The duration of the study was from January 2021 to June 2022. The sample size taken for this study was 92 patients. All patients of either gender presenting to the General Surgery Opd with a history of blunt abdomen injury were included in the study. Pregnant females, and patients presenting with penetrating injuries of the abdomen, and with severe head/chest/orthopaedic injuries (urgent) were excluded from this study. Written informed consent with regard to the procedure was taken. All the patients participating in the study were explained about the nature and purpose of the study in their local language. Once patients enrolled into the study, detailed history of patients was taken with regard to symptoms, their duration and severity, drug history, and bleeding disorders. History of alcohol and smoking, radiation and blood transfusion was collected. Thorough general physical and systemic examinations

were performed. Routine haematological, biochemistry, and coagulation profile was done. If necessary Radiological investigations in the form of X-ray, ultrasound of the abdomen, four quadrantic tapping and CECT (A+P) were done and a provisional diagnosis was made.

**Results**

**Table1: Distribution according to symptoms**

Clinical presentation	No of patients (n=92)	Percentage %
Abdominal pain	88	95.65
Vomiting	15	16.30
Abdominal distension	51	55.43
Hematuria	06	06.52

The above table shows the distribution of patients according to clinical presentation. It was observed that the majority of patients had abdominal pain (95.65%)

**Table 2: Distribution according to four quadrant aspiration**

Four quadrant aspiration	No of patients (n=32)	Percentage %
Positive	21	65.62
Negative	11	34.38
Total	32	100

The above table shows the distribution of patients according to four-quadrant aspiration. It was observed that the majority of patients had positive findings. (65.62%)

**Table 3: Distribution according to associated injuries**

Associated injuries	No of patients (n=92)	Percentage %
Head	11	11.95
Thoracic	06	06.52
Orthopedic	16	17.39
Soft tissue	07	07.61
Combined	06	06.52

The above table shows distribution of patients according to associated injuries. It was observed that majority of patients had orthopaedic injury (17.39%) followed by head injury (11.95%)

**Table 4: Distribution according to organ injured by USG examination**

Organ injured	No of patients (n=92)	Percentage %
Liver	27	29.35
Spleen	33	35.87
Kidney	04	04.35
Free fluid without solid organ	34	36.96

The above table shows the distribution of patients according to organ injured. It was observed that the majority of patients had spleen injury (35.87%) followed by liver (29.35%) and kidney. (4.35%)

Table 5: Relation of risk factors leading to blunt abdomen trauma mortality

Risk factors	OR (CI 95%)	P- value
Age >40 years	2.28 (1.62-5.22) *	0.02 (S)
Male gender	1.18 (0.36-2.88)	0.32 (NS)
Mode of injury (RTA)	3.19 (1.52-5.83) *	0.007 (S)
Alcohol	4.12 (2.88-6.24) *	0.001 (S)
Associated injuries	3.28 (1.78-5.19) *	0.03 (S)
Solid organ injury	3.13 (1.82-6.83) *	0.002 (S)
Surgical management	3.11 (1.42-3.98)	0.04 (S)

The above table shows the distribution of patients according to risk factors leading to blunt abdomen trauma mortality. It was observed that age >40 years, RTA, alcohol consumption, associated injuries, solid organ injury and surgical management showed significant relation with blunt abdomen trauma mortality.

**Discussion**

In the present study, the distribution of patients according to clinical presentation showed that 95.65% had abdominal pain.

D. Sujatha et al <sup>5</sup> in a clinical study of blunt injury abdomen observed the majority of the patients presented with abdominal pain (86%) and abdominal tenderness (81%). However, the signs and symptoms of abdominal injuries are notoriously unreliable and are often masked by concomitant head injuries, chest injuries, and pelvic

fractures. Significant injuries to the retroperitoneal structures may not manifest signs and symptoms immediately and be totally missed even on abdominal X-rays and DPL predisposing the patients to grave consequences of missed injuries.

In Davis et al. <sup>6</sup> study, generalized abdominal tenderness and abdominal guarding were the most frequent physical findings, both signs being present in more than 75% of all patients. Rebound tenderness and abdominal rigidity were present in 28% of patients. About 12% of the patients were in hypovolemic shock on admission. One hundred and ninety (43%) of the total patient population had no specific complaints and no signs or symptoms of intra-abdominal injury when they were first seen in the emergency room, but 44% eventually required exploratory laparotomy, and 64 (34%) had an intra-abdominal injury. This emphasizes the importance of careful and continuing observation of individuals with blunt abdominal trauma. The distribution of patients according to four quadrant aspiration observed that the majority of patients had positive findings. (65.62%)

In Davis et al <sup>6</sup> study one hundred-twenty (27%) of the 437 patients had blunt chest trauma. Thirty-seven patients required either tube thoracostomy or operative thoracotomy. Fifty-one patients (11%) sustained an associated extremity fracture, 15 (3%) sustained pelvic fractures, and three patients sustained vertebral fractures. Another 28(6%) had combinations of associated injuries. Of the 41(8%) patients who sustained a serious head injury in addition to BAT, 3% died. Head injury was directly responsible for death in of majority of these patients. Associated injuries tend to increase morbidity and mortality directly or indirectly. The distribution of patients according to organ injured showed that the

majority of patients had spleen injury (35.87%) followed by liver (29.35%) and kidney. (4.35%)

Mumtazdin Wani et al <sup>7</sup> studied magnitude and to assess various management with blunt abdominal trauma observed Splenic injury remained still the commonest finding 29.21% and was seen in 26 out of 89 cases. Another frequently injured organ was the liver in 21.34% while free intraperitoneal fluid was picked in 29.44% of cases, organ injury without free fluid in the peritoneal cavity was observed in 14.2%

In the present study, it was observed that age >40 years, RTA, alcohol consumption, associated injuries, solid organ injury and surgical management showed significant relation with blunt abdomen trauma mortality. Sylvania Klug Pimentel et al <sup>8</sup> observed risk factors for mortality in patients with blunt abdominal trauma observed the presence of solid organ injury, multiple intra-abdominal injuries, need for damage control surgery, serious injury association and low index of trauma score associated with mortality.

Early diagnosis and repeated clinical examination and the use of appropriate investigation form the key to the management of blunt abdominal trauma. Associated extra-abdominal injuries like head, thoracic and orthopaedic injuries influenced the morbidity and mortality of the patients.

### Conclusion

The present study concludes that road traffic accidents were the most common cause of blunt abdominal trauma in this study, involving the younger age group between 21-30 years most commonly. Males sustaining blunt abdominal trauma outnumbered females. Diagnostic investigations like FAST, X-ray erect abdomen and CT scan form an important tool in the management of these trauma patients. Among the solid organs, the spleen and

liver were the most injured organs. Early diagnosis and repeated clinical examination and the use of appropriate investigation form the key to the management of blunt abdominal trauma. Associated extra-abdominal injuries like head, thoracic and orthopaedic injuries influenced the morbidity and mortality of the patients.

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