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Original Research Article

Study of Abdominal Trauma – patterns of injury , Clinical Profile and Management: A Prospective Study

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Abstract:

Background: Abdominal trauma significantly contributes to illness and death in emergency surgery, especially in areas with increasing road traffic accidents. Both blunt and penetrating injuries create challenges for diagnosis and treatment, often requiring quick action.

Objectives: This study aimed to assess the clinical profile, presentation, diagnostic methods, management, and outcomes of patients with abdominal trauma at a tertiary care hospital.

Methods: A prospective observational study was carried out at Al-falah medical college faridabad, haryana over two and half years (2023 to 2025). Seventy patients with abdominal trauma were enrolled after giving informed consent. We analyzed clinical data, injury type, imaging findings, organ involvement, management approaches, and outcomes using both descriptive and inferential statistics.

Results: The average age of patients was 30.5 years, with a range from 14 to 65 years. Most patients were young adults between 21 and 30 years old (37.1%), and there was a male predominance (M:F = 4.8:1). Road traffic accidents (54.3%) and falls (37.1%) were the main causes of injury. Abdominal pain (91.4%) and tenderness (48.6%) were the most common symptoms. The FAST exam was positive in 81.5% of cases, showing splenic injuries (47.2%), liver injuries (39.6%), and renal injuries (9.4%). Conservative management was successful in 68.6% of patients, while 31.4% needed surgical procedures, including splenectomy, liver repair, nephrectomy, and bowel resection. Complications included wound infections, sepsis, and respiratory issues; mortality was linked to delayed care and severe bleeding.

Conclusion: Abdominal trauma mainly impacts young males, with road traffic accidents as the leading cause. Non-operative management works well for most hemodynamically stable patients, while timely surgery is critical for those in unstable condition. Improving pre-hospital care, raising trauma awareness, and enhancing diagnostic facilities can help lower illness and death rates.

Keywords: Abdominal Trauma, Blunt Injury, Penetrating Injury, FAST, Splenic Injury, Conservative Management, Laparotomy.

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Introduction

Trauma is a major health issue and is one of the top ten causes of death worldwide. Abdominal trauma, which includes both blunt and penetrating injuries, significantly contributes to preventable deaths in emergency surgery. [1] Blunt abdominal trauma (BAT) is particularly common. [2] It often results from road traffic accidents, falls, and assaults. Penetrating injuries usually come from stabbings or gunshots. [3]

In blunt trauma, injuries to the spleen and liver are most frequent. In contrast, hollow viscus and diaphragmatic injuries are common with penetrating trauma. [4] Diagnosing abdominal trauma can be difficult because it often shows subtle signs. This can lead to delays in recognition and treatment. [5] FAST (Focused Assessment with Sonography for Trauma) and CT scanning have greatly improved early detection. [6] Advances in critical care and interventional radiology have shifted the focus toward selective non-operative management. [7] In India, an increase in road traffic accidents, along with poor pre-hospital care and delayed referrals, makes abdominal trauma a significant clinical challenge. [8] This study aimed to assess the clinical spectrum, diagnostic methods, management strategies, and outcomes of abdominal trauma cases at AFSMRC, medical college in North India.

Materials and Methods

This was a prospective observational study carried out in the Department of General and Minimal Invasive Surgery at AFSMRC, over two and half years from 2023 to 2025.

Inclusion Criteria: All adult patients presenting with abdominal trauma in the surgical emergency department; patients undergoing initial or repeat laparotomy.

Exclusion Criteria: Pediatric patients, patients with related cancers or who were critically ill on arrival, and patients who did not consent to participate.

Data Collection: We recorded demographic details, the mechanism of injury, clinical presentation, vital signs at admission, radiological findings (FAST/CT), organ involvement, management plans, and outcomes.

Management Protocol: We managed hemodynamically stable patients with solid organ injuries conservatively with monitoring, IV fluids, and blood transfusions as needed. Unstable patients or those with perforations of hollow organs underwent laparotomy. We followed postoperative patients for complications.

Statistical Analysis: We entered data in Microsoft Excel and analyzed it using SPSS v20. We expressed continuous variables as mean ± SD and categorical variables as frequencies and percentages. A p-value of less than 0.05 was considered statistically significant.

Results

Seventy patients were included in the study. The demographic and clinical profile is summarized below.

Table 1: Age Distribution of Patients

Age Group (years)	Number	Percentage
≤20	17	24.3%
21–30	26	37.1%
31–40	15	21.4%
41–50	8	11.4%
>50	4	5.7%

Mean Age: 30.5 ± 11.6 years

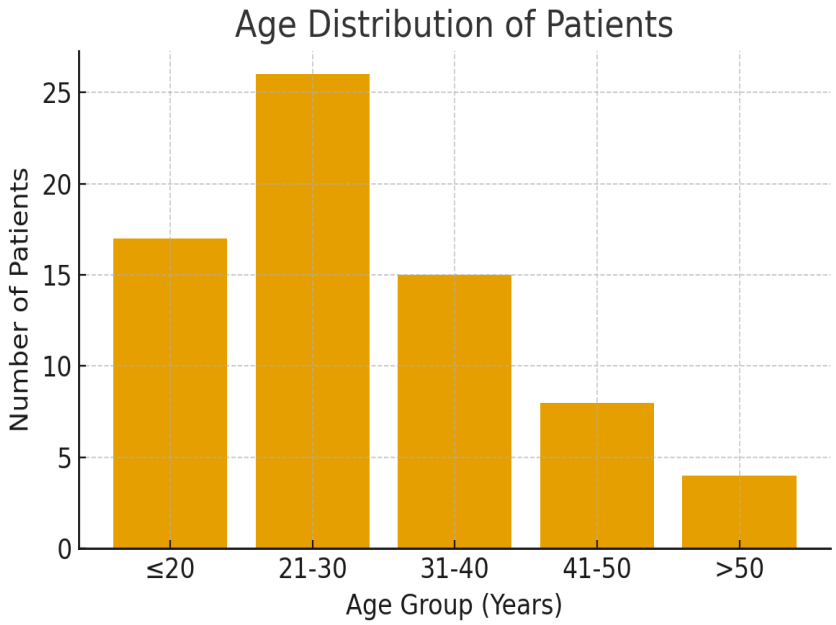

Figure 1: Age distribution of patients

Table 2: Gender Distribution

Gender	Number	Percentage
Male	58	82.9%
Female	12	17.1%

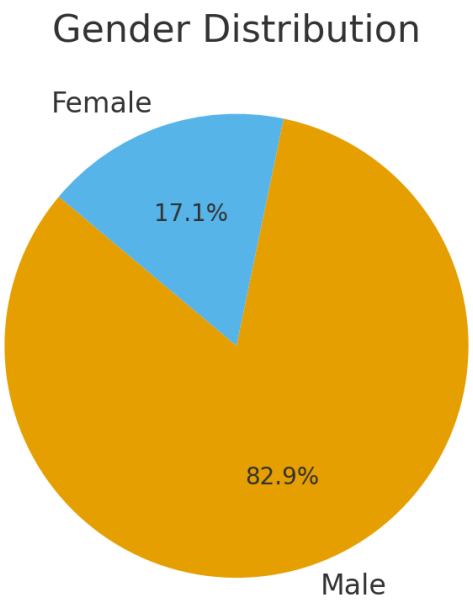

Figure 2: Gender distribution

Table 3: Mode of Trauma

Mode	Number	Percentage
Road traffic accident	38	54.3%
Fall from height	26	37.1%
Hit by stone	4	5.7%
Assault	2	2.9%

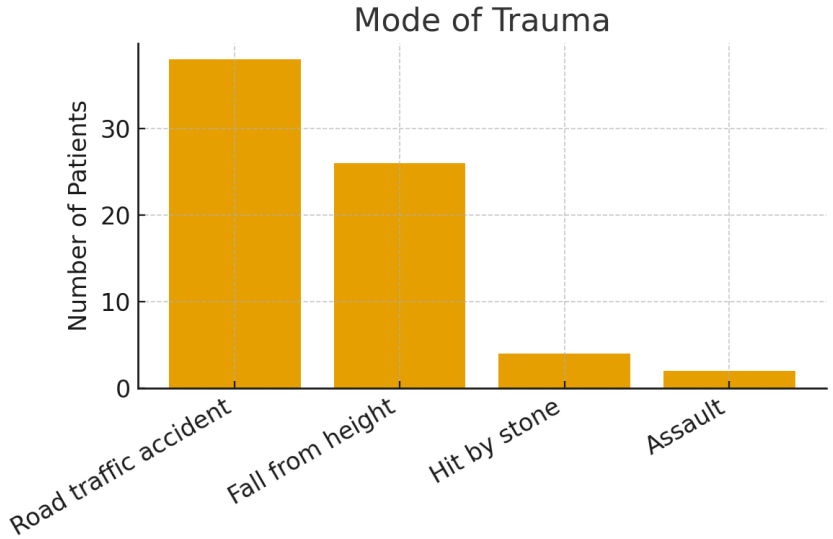

Figure 3: Mode of trauma

Table 4: Organ Involvement

Organ	Number	Percentage
Spleen	25	47.2%
Liver	21	39.6%
Kidney	5	9.4%
Ileum	2	3.8%

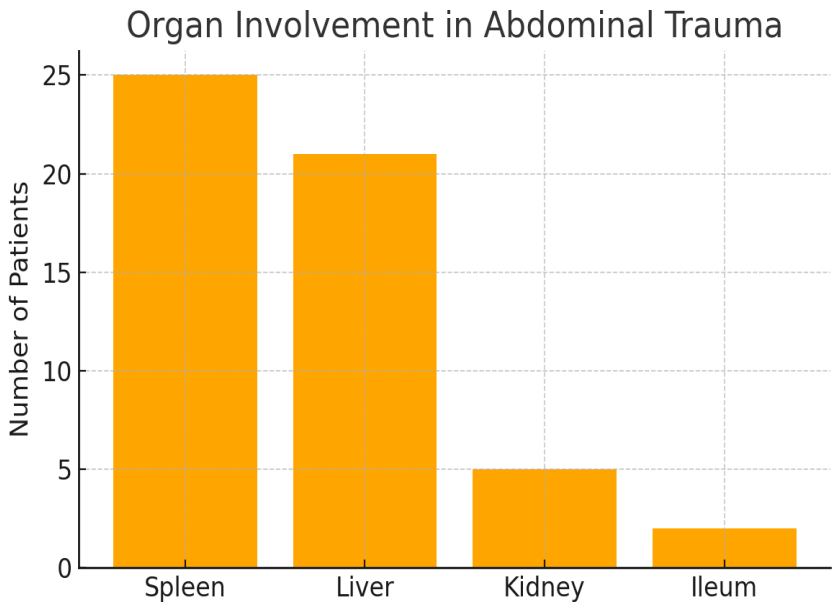

Figure 4: Organ involvement in abdominal trauma

Discussion

This study shows that abdominal trauma is a significant surgical challenge, especially in young adult males, which aligns with past research.1 Road traffic accidents were the main cause, highlighting the growing issue of vehicle-related injuries in developing countries. [2-5]

The spleen (47.2%) was the most commonly injured organ, followed by the liver, in line with reports by Mehta et al. [6] and Wani et al. [7]. The shift towards conservative management of splenic and hepatic trauma mirrors global trends, emphasizing organ preservation when feasible [8,9].

Despite improvements in diagnosis, there are still issues with morbidity and mortality caused by delayed referrals, insufficient pre-hospital care, and related polytrauma. The FAST exam proved very useful as a first-line diagnostic tool, but CT scans are still better for grading injuries. [4,10]

The overall operative rate was 31.4%, similar to reports from studies in Africa and South Asia, where hollow viscus perforations and uncontrolled bleeding remain major reasons for surgery. Although the mortality rate is low, it emphasizes the importance of timely resuscitation and early intervention. [3-5]

Conclusion

Abdominal trauma mostly impacts young males. Road traffic accidents are the main cause. The most common injuries involve the spleen and liver. In most stable cases, non-surgical treatment is possible. However, surgery is essential for unstable patients and injuries to hollow organs. Improving trauma systems, making early diagnoses with imaging, and using selective non-surgical approaches can greatly lower deaths and health problems.

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