

INCIDENCE, OUTCOME, AND MORTALITY PROFILE OF SOLID ORGAN INJURIES AMONG PATIENTS WITH BLUNT ABDOMINAL TRAUMA IN A TERTIARY CARE HOSPITAL: A PROSPECTIVE STUDY

NEETU SINGH¹, SAMRIDH KUMAR², SANDEEP KHADDA², DAWAN ML^{2*}

¹Department of General Surgery, SMS, Jaipur, Rajasthan, India. ²Department of General Surgery, Sardar Patel Medical College, Bikaner, Rajasthan, India.

*Corresponding author: Dawan ML; Email: drmanohar_dawan1234@yahoo.com

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ABSTRACT

Objective: The objective is to evaluate the histopathology and establish a correlation between placental changes in hypertensive disorders of pregnancy and fetal outcome. To assess the solid organ injuries in blunt trauma abdomen patients with respect to management and outcome in a tertiary care hospital.

Methods: A prospective descriptive type of study was conducted in a tertiary care hospital including 100 study participants from December 2021 to November 2022. All the patients with the diagnosis of the blunt abdominal trauma were assessed clinically at the time of presentation. After obtaining written informed consent, the detailed information regarding the mode of injury, clinical presentation was collected and recorded. Records were maintained about nonoperative and operative management duration of stay and outcome of patients. The data collected were then entered into MS Excel sheet and analyzed using SPSS v20.0. The data were presented in the form of numbers and proportions.

Results and Conclusion: 76% of study participants reported to hospital within 6 h of trauma. 83% of patients had undergone conservative management, while 13% were managed surgically. The mortality rate among study participants was 5%.

Keywords: Abdominal trauma, Road traffic accidents, Descriptive study, Clinical presentation.

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INTRODUCTION

Trauma is a major health problem in our country accounting for around 8% of deaths per year. Every year in India, about 1,40,000 individuals die in accidental deaths and approximately double the number are disabled. Trauma is the leading cause of death in the population under the age of 45 years old [1]. Blunt trauma refers to physical trauma caused to a body part, either by impact, injury, or physical assault. Blunt trauma to the abdomen needs to be carefully evaluated to increase the chances of patient survival. Swift use of diagnostic modalities and vigorous therapy to attend to life-threatening problems should be administered. Focused assessment with sonography for trauma (FAST) has emerged as a useful tool in the evaluation of blunt injury abdomen [2]. In patients who are hemodynamically stable, there has been a notable shift from routine surgical to non-operative management (NOM) of blunt abdominal trauma [2]. However, the traditional Organ Injury Scale defined by the American Association for the Surgery of Trauma (AAST) has significant shortcomings [3], especially in the prediction of solid organ injuries amenable to NOM. In particular, the recognition of low-grade injuries may fail with observation alone. The management of solid organ blunt trauma abdomen has undergone a paradigm shift from immediate explorations, as was the norm, to a conservative and more selective management today because of better intensive monitoring of patients aided by non-invasive technology. The development of newer therapeutic modalities – such as embolization of bleeding vessels, ultrasound or CT-guided drainage, and advances in critical care management have increased the chances of nonsurgical management. Operative interventions need to occur expeditiously in hemodynamically unstable patients. The evidence regarding the outcome and mortality profile of patients with solid organ injury in blunt abdominal trauma patients was relatively scarce. Hence, this study was planned with an objective to study the solid organ injuries in blunt trauma abdomen patients with respect to management and outcome in a tertiary care hospital [4].

METHODS

A prospective descriptive study was conducted in a tertiary care hospital. The study included 100 study participants with blunt abdominal trauma with solid organ injuries using a convenient sampling method. The study was conducted between December 2021 and November 2022. Only patients presenting within 48 h of trauma were included in the study.

The patients with penetrating abdominal trauma, patients without solid organ injuries, pregnant females, and pediatric patients were excluded from the study. The patients with a diagnosis of blunt abdominal trauma were assessed clinically at the time of presentation. After a primary survey and initial resuscitation as per the latest ATLS guidelines, written consent was sought from the patients. Those who gave the consent were included in the study. History regarding age and sex, mode of injury and site of injury, duration, and progress of the symptoms was recorded from the patients. If the patient was not in a condition to give history, then it was recorded from the relatives or accompanying persons.

Detailed examination was done in relation to abdominal tenderness, guarding, rigidity, lump in abdomen. Per rectal examination was done. Examination to look for head trauma, thoracic injuries, and extremity injuries was also done. The general condition of the patient assessed and noted down. If the patient was found in shock, then adequate resuscitation was carried out initially and according to hemodynamic status, he/she was shifted for particular radiological investigations. A radiological examination was done. Plain X-ray of erect abdomen and Chest X-ray was done to rule out hollow viscus injury. E-FAST and CT abdomen were done as indicated according to the patient's hemodynamic status on a case-to-case basis.

Relevant biochemical and pathological investigations were done in all the cases. Records were maintained about nonoperative and operative

management and duration of stay and outcome of patients. The data were entered into MS Excel sheets and was analyzed using SPSS v 20.0. The data were presented as number and proportions.

RESULTS

In the present study, a total of 100 participants with blunt abdominal trauma were included. It was observed that majority (85%) of participants were male. According to the age group, it was observed that majority (55%) were in 21–40 years of age group followed by 21% in 41–60 years of age group (Table 1).

Regarding solid organ involvement, the most common solid organ involved in blunt trauma was spleen (48%), followed by liver (42%), pancreas was least commonly involved organ. On CT scan evaluation, it was observed that 41% of patients had Grade II injury, followed by 32% with Grade I injury, whereas only 2% of patients had Grade V injury (Table 2).

It was observed that maximum participants (76%) reported within 6 h of injury to the hospital, followed by 18% who reported within 6–24 h, whereas only 6% reported after 24 h (Table 3).

Spleen was involved among maximum number of subjects (Fig. 1).

Regarding the solid organ involved during blunt abdominal trauma, it was observed that spleen was involved in 48% of patients, followed by 42% with liver involved, whereas only 3% had pancreatic injury (Fig. 1). During the course in the hospital, it was observed that 87% of patients were managed conservatively, while 13% had undergone operative management (Table 4). In this study it was observed that the average hospital stay was higher (11.3 days) among those who had undergone operative management as compared to those who were managed conservatively (6.12 days). The overall duration of stay in hospital was 6.8 days (Table 4).

Regarding the outcome of the patients, it was observed that mortality rate was 5%. Out of 5 deaths, 3 underwent surgical intervention and 2 were being managed conservatively. 95% of patients were improved and eventually discharged (Table 5).

Out of total 5 deaths two died of sepsis, one underwent pancreateojejunostomy and other patient underwent splenectomy. The third patient died of post-splenectomy ARDS. Two deaths from the conservative management group one died of brain stem injury and the other died of hemorrhagic shock.

DISCUSSION

The present study involved 85% male participants and 15% female participants with male to female ratio 5.6:1. The result of this study was similar to a study conducted by Ramachandra and Krishna [5], Agrawal et al. [6], Baldiwala and Lad et al. [7], and Prashanth et al. [8] where also male patients constituted maximum proportion of cases.

The most common solid organ to involve during trauma was observed to be spleen (48%), followed by liver (42%) in the present study. The findings were comparable to study conducted by Baldiwala and Lad et al. [7] and Mehta et al. [9] where also spleen was the most common organ involved.

The average length of stay in the hospital was observed to be 6.8 days, with 6.12 days and 11.3 days for conservative and surgically managed groups, respectively. The findings were similar to study conducted by Baygeldi et al. [10] where the average stay was 6.46 days with 5.98 days and 8.13 days for conservative and surgical groups, respectively. The findings were in contrast to study conducted by Jain et al. [11] where average hospital stay was higher, i.e., 14.4 days and 16.25 days for conservative and surgically managed groups respectively. This could be due to the reason that the duration of

Table 1: Distribution of study participants as per demographic status and mode of injury

Variable	Number (%)
Gender	
Male	85 (85)
Female	15 (15)
Age group	
18–20 years	18 (18)
21–40 years	55 (55)
41–60 years	21 (21)
>60 years	6 (6)

Table 2: Distribution of study participants according to radiological findings (n=100)

Variable	Number (%)
Solid Organ involved	
Spleen	48 (48)
Liver	42 (42)
Kidney	4 (4)
Pancreas	3 (3)
Liver+spleen	3 (3)
Grade of injury	
I	32 (32)
II	41 (41)
III	23 (23)
IV	5 (5)
V	2 (2)

Table 3: Distribution of study participants as per time elapsed between injury and admission (n=100)

S. No.	Time (hours)	No. of patients (n=100)	Percentage
1.	<6 h	76	76
2.	6–24 h	18	18
3.	>24 h	6	6
Total		100	100%

Table 4: Management-wise distribution of study participants (n=100)

S. No.	Management	No. of patients (%)
1.	Operative	13 (13)
2.	Conservative	87 (87)
Total		100

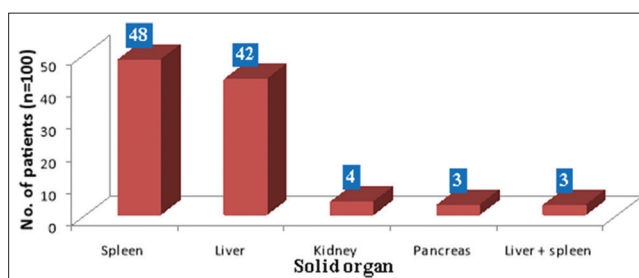


Fig. 1: Distribution of study participants according to solid organs involved (n=100)

hospital stay largely depends on institutional criteria of conservative versus surgical management.

In the present study, 87% of patients were managed conservatively and 13% surgically. The findings were similar to the study conducted

Table 5: Analysis of death cases (n=5)

S. No.	Age (years)	Sex	Injury/Diagnosis	Associated injury	Management	Cause of death
1.	55	Male	Spleen	None	Splenectomy	ARDS
2.	65	Male	Liver	Femur fracture	Conservative	Hemorrhagic shock
3.	40	Female	Spleen	Head injury	Conservative	BRAIN stem injury
4.	24	Male	Pancreatic injury	Chest injury	Pancreaticojejunostomy	Sepsis
5.	43	Male	Spleen	Chest injury	Splenectomy	Sepsis

Verma *et al.* [12] where 84% of patients were managed conservatively and 16% surgically. A study by Jain *et al.* [11] reported that 86.7% were managed conservatively and 13.3% were surgically managed, which was also similar to the present study. The findings were in contrast to study conducted by Prashanth *et al.* [8] where only 31.66% were managed conservatively, while 68.33% were surgically managed. This difference could be due to the reason that study by Prashanth *et al.* [8] included small bowel injury and mesenteric tears in addition to solid organ injuries.

The mortality rate was observed to be 5% in the present study. This finding was similar to the study conducted by Agrawal *et al.* [6], Verma *et al.* [12] and Mehta *et al.* [9] which reported mortality rate to be 6%, 4% and 4% respectively. The findings were in contrast to study conducted by Prashanth *et al.* [8] which reported 13.3% mortality rate which could be due to the reason that later study included small bowel injury and mesenteric tear injury patients in addition to solid organ injury patients.

CONCLUSION

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AUTHORS' CONTRIBUTION

All the authors have contributed equally.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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