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A Clinical Study of Blunt Trauma Abdomen with Respect to Management and Outcome in a Medical College Hospital at Purulia

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ABSTRACT
The abdomen is the third most often damaged body component, after the head and extremities injuries due to blunt trauma. Blunt Abdominal trauma (BAT) can cause significant and even fatal internal organ damage but it can be particularly misleading because clinical symptoms may not appear for hours or even days. Traffic Accidents (TRAs) are the most frequent type of injury that result in organ damage. The present study was an Observational study. This Study was conducted from May 2022 to April 2023 at the Department of General Surgery, Deben Mahata Government Medical College Hospital, Hatuara. Purulia. Total 50 patients were included in this study. Charts and tables were used to explain the observations, which involved 50 patients in all. A third of the patients (33%) were between the ages of 20 and 30, then 31-40 (27%), over 40 (24%) and less than 20 (16%). The patients' average age was 34.20±15.48 years. 42 patients (84%) out of all the patients were men. The study found that the most often impacted category was young men who had BAT as a result of RTA. Additionally, it was determined with certainty that the liver and spleen are the solid organs most frequently harmed in BAT and that conservative (expectant) management should be used whenever feasible. Patients with lower hemoglobin levels upon presentation had a noticeably greater mortality rate.

INTRODUCTION

Despite its intimate association with humans, Trauma has been referred to be the underappreciated illness of contemporary civilization. Trauma is the most prevalent cause of mortality for people under 45 years old and the top cause of disability and death in developing nations.

Global urbanization, motorization, industrialization and changes in socioeconomic values are occurring in many countries. India is not an exception to this evolving pattern. Owing to these shifts, Road Traffic Accidents (RTA) have emerged as the world's most significant public health risk, posing one of the biggest risks to public safety and human life[1]. When it comes to the number of fatalities from road accidents, India leads the world[2].

The abdomen is the third most often damaged bodily component, behind the head and extremities. Two main categories may be used to broadly classify Abdominal trauma:

- Penetrating trauma to the abdomen
- Blunt trauma to the abdomen. Amongst the two, Blunt trauma to the abdomen is the more common form of injury

Among the various reasons of blunt abdominal trauma, some of the more prevalent ones include Road traffic accidents, sports injuries, falls from heights, military injuries, battering, martial arts, athletics, mountaineering, etc. The most prevalent cause of blunt trauma abdomen is a car collision. Abdominal blunt trauma can be caused by external compression, crushing, or deceleration[3].

Assessing blunt abdominal injuries thoroughly is necessary to improve the prognosis for the patient. In order to address urgent, life-threatening issues, prompt use of diagnostic techniques and intensive therapy should be used. Focused Assessment Sonography for Trauma, or FAST, has become an invaluable method for assessing abdominal impact injuries. In hemodynamically stable patients, Computed Tomography Scan is the next imaging modality. It mat be necessary to explore the abdomen for diagnosis rather than wait, because diagnostic modalities are unavailable or too expensive[4].

After physical trauma to the abdomen, concealed bleeding is the second most common cause of death. In patients who survive the initial stages of the accident, overlooked abdominal injuries are frequently the source of morbidity and late fatality. Reduced morbidity and death are the outcome of close observation and prompt administration of appropriate medication and urgent surgical exploration.

MATERIALS AND METHODS

Study design: This is an observational study.

Study duration: May 2022 to April 2023.

Sample size: 50

Study population

Description of the study population:

- **Setting:**
  - **Hospital:** Deben Mahata Government Medical College and Hospital. Hatuara. Purulia
  - **Time frame:** May 2022 to April 2023.

Total number of participants:

- Provide the estimated or actual number of patients included in the study.

Inclusion criteria:

Patients who meet the following criteria will be included in the study:

- **Diagnosis:** Confirmed blunt abdominal trauma, as determined by clinical assessment and imaging studies
- **Age range:** Patients aged 18 years and older. (or specify another age range if applicable)
- **Gender:** Both male and female patients.
- **Consent:** Informed consent obtained from all participants or their legal guardians.

Exclusion criteria: Patients will be excluded from the study if they meet any of the following criteria:

- **Type of trauma:** Penetrating abdominal trauma (stabbing, gunshot wounds, bullets).
- **Co-morbidities:** Severe co-morbid conditions that could confound the results (e.g., terminal illness, advanced malignancy).
- **Incomplete data:** Incomplete or insufficient medical records that impede comprehensive analysis.
- **Other considerations:** Patients who are not suitable for study inclusion due to severe mental incapacity or other reasons that prevent informed consent.

RESULTS

A total of 50 patients were observed and the observations were interpreted in form of charts and tables.

About one third of the patients were of 20-30 years age (33%) followed by 31-40 (27%), >40 (24%) and <20 (16%) years. The mean age of patients was 34.20±15.48 years. Among all the patients, 42 (84%) were males (Table 1).

Table 1: Depicts the various age group of the presenting population

Age in years	No. (n = 50)	Percent
<20	8	16
20-30	16	33
31-40	14	27
>40	12	24
Mean±SD	34.20±15.48	

Table 2: Depicts the commonly injured organ in CT scan

Organ injured	No. (n = 38)	Percent
Spleen	11	36.7
Liver	12	40.0
Kidney	1	3.3
Hollow viscus	4	13.3
RPH	2	6.7

Table 3: Depicts the mortality and its association with the presenting Hb.

		Death		Improved		
Hb	No. of patients	No.	Percent	No.	Percent	p-value[1]
<8	2	1	100.0	0	0.0	0.001*
08-10	24	2	4.2	23	95.8	
>10	24	0	0.0	24	100.0	

About half of the patients had RTA (48%) followed by assault (30%) and self-fall (22%) as their mode of injury. Spleen was found to be the most commonly organ injured on USG (44%). Liver was found to be the second most commonly organ injured on USG (36%).

Liver was found to be the most common organ injured in CT findings (40%). Spleen was the second most common organ injured in CT findings (36%) (Table 2).

36% (18) of the patients underwent emergency laparotomy because of pneumoperitoneum, or hemodynamic instability or peritonitis. 64% (32) patients were managed conservatively (Table 3).

Mortality was observed in 3 (6%) of the patients. All the mortality were in the patients who had Hb<8. The association of outcome with Hb was significant (p = 0.001).

DISCUSSION

Even the most skilled traumatologists find treating blunt abdominal trauma to be dangerous. Forty percent of individuals with hemoperitoneum may not have any abdominal abnormalities. Occasionally, additional, more noticeable exterior injuries may conceal the clinical assessment of blunt abdominal injuries[5].

One of the leading causes of death for the younger population (those between the ages of 1 and 45) is trauma. The frequency of Blunt Abdominal Trauma (BAT) is considerable, with reports indicating a 12- to 15% incidence of intra-abdominal damage following BAT. Auto-pedestrian collisions (6%), motor vehicle collisions (73%), motorbike collisions (7%) and falls (6%), were the processes leading to BAT[6].

In 25% of instances when surgical intervention is necessary, the abdomen is the third most often wounded area. There are two categories for abdominal trauma: Penetrating and blunt. While problems from blunt trauma may go unnoticed if the clinical indications are not immediately apparent, penetrating abdominal trauma is quickly recognized. An accurate and quick imaging technique is necessary to evaluate related abdominal visceral injuries because of hemodynamic instability, altered awareness and the existence of other injuries in the chest, pelvic bones, or extremities[7].

The goal of the current study was to examine the management and results of blunt trauma to the abdomen in a peripheral district Medical College Hospital at the Deben Mahata Government Medical College Hospital, Hatuara. Purulia.

The study comprised 50 individuals with abdominal blunt trauma in total. Regarding the patients in the current study, around one-third were between the ages of 20 and 30 (33%) and then 31 to 40 (27%), >40 (24%) and under 20 (16%). The patients' average age was 34.20±15.48 years. In 2019, Anarase and Anarase[8] discovered that the most prevalent age group among the 260 patients with blunt trauma abdomen was 21-40 years old. In Umare *et al*.[9], 76% of instances of blunt abdominal trauma occurred in people between the ages of 11 and 40. According to Rahman and Das (2018)20, 39% of BAT patients were in the age range that was most prevalent, which was 21-30 years old. The mean age was thirty-eight years. Shah *et al*.[10] 34 BAT patients were examined. The age group of patients aged 20-30 years comprised 29.4% of the total, with a mean age of 35.29±15.84 years.

Majority of patients were males (84%) in this study. As in this study, Anarase and Anarase[8] discovered a 62.70% male prevalence in individuals with acute abdominal injuries. We discovered that the majority of those with blunt abdominal injuries were men.

About half of the patients sustained RTA (48%) followed by assault (30%) and self-fall (22%) in the present study. Anarase and Anarase[8] also discovered that the main cause of trauma was automobile accidents. In the study of Rahman and Das[11], the most common cause of BAT was found to be road traffic accidents (67%) which was slightly higher than the present study. Shah *et al*.[10] also found that road traffic accident was responsible for 79.4% of blunt abdominal trauma cases. Arumugam *et al*.[12] showed that road traffic accidents (61%) were the most frequent mechanism of injury followed by fall from height (25%) and fall of heavy object (7%).

When used with resuscitation techniques, ultrasound is a non-invasive, portable, reproducible and simple study that uses non-ionizing radiation in the emergency room. A quick examination technique called focused abdominal sonography for trauma (FAST) may reveal intraperitoneal fluid. This method

has been shown in many trials to be sensitive (79-100%) and specific (95.6-100%), especially in individuals who are hemodynamically unstable[13].

According to USG findings, the spleen was the most frequently damaged organ in the current research (44%). According to USG findings, the liver was the second most often damaged organ (36%). In CT results, the liver was the organ most often damaged (40%). According to CT results, the spleen was the second most often wounded organ (36%). In 2019, Anarase and Anarase[8] discovered that, at 37.69% and 25%, respectively, the spleen and liver were the most frequently affected organs. The incidence of the kidney, another solid organ, is 2.3%. Compared to solid organ injury, hollow viscous damage was less severe. Similar results were found in this investigation to those published by Parreira *et al*.[14] and Mehta *et al*.[15]. While Ravikanth *et al*.[16] discovered that liver damage (26%) outweighed splenic injury (20%). 108 patients (41.53%) had associated injuries such as head traumas, chest injuries, pelvic fractures and other orthopedic injuries.

In this research, 64% of the patients received conservative treatment. In terms of surgical care, bowel perforation repair was performed on over half of the patients (55.55%), followed by splenectomy (27.77%) and perihepatic packing (16.66%) in cases of liver damage. In 2019, Anarase and Anarase[8] showed that the commonest procedure done was Splenectomy (34.8%). Umare *et al*.[9] revealed that 42% of BAT patients needed surgical procedures, whereas 58% of patients received conservative care. Splenectomy (28.57%), primary closure of perforation (23.80%) and resection and anastomosis (19.04%) were among the frequently performed operations in the patients under study. Das and Rahman[11] revealed that a cautious approach was used to treat 53.52% of patients with solid organ injuries. 25 (41.7%) of the 60 operational patients had their procedures completed in three to six hours. Shah *et al*.[9] revealed that 9 patients (26.5%) had exploratory laparotomies. Twenty-five were chosen for non-operative care. In 2017, Kurane and Ugane[17] revealed that 66% of patients experienced postoperative problems and that the ileum was the most frequently perforated location.

This study found that the mortality was observed in 6% of patients. Shah *et al*.[9] found that mortality was among 8.8% BAT patients. Kurane and Ugane[17] reported a higher patient fatality rate of 22.22% than in the current research. Arumugam *et al*.[12] discovered that the total death rate was 8.3% and that 2.3% of patients had late mortality, mostly as a result of sepsis and serious brain injuries. Serum lactate levels, ISS, head injuries and the requirement for blood transfusions were the predictors of death.

The study revealed that individuals between the ages of 20 and 30 had a higher death rate (11.8%). But there was little evidence of a relationship between age and outcome ($p>0.05$). In this study, it was shown that female patients had a greater death rate (12.5%) than did male patients (48%). Nonetheless, there was little evidence of a gender effect on the result ($p>0.05$). In this research, the death rate for self-falls was 9.1%, compared to 6.7% for assaults and 4.2% for RTAs.

Nevertheless, there was no significant correlation ($p>0.05$) between the manner of damage and the result. Comparisons could not be made since, to the best of the researcher's knowledge, none of the studies had revealed such relationships.

CONCLUSION

In this study, it was shown that blunt abdominal trauma was most frequently caused by traffic accidents, which mostly affected younger age groups between 30 and 35 years old. The number of men who had blunt abdominal injuries exceeded that of women. In the treatment of these trauma patients, diagnostic tests such as the FAST, X-ray erect abdomen and CT scan abdomen are crucial. The most often damaged solid organs were the liver and spleen, although intestinal injuries were also observed in a sizable proportion of cases. As previously said, if used wisely, the conservative strategy is safer and more effective than the surgical technique. Adhering strictly to traffic regulations, making improvements to the road, installing pedestrian overpasses and lighting and other measures can lower the likelihood of collisions and, consequently, abdominal injuries. The morbidity and death rate of these individuals are increased by delayed presentation, involvement of many intra-abdominal organs, extra-abdominal injuries and co-occurring disorders. The prognosis for trauma patients may be enhanced by prompt surgical intervention, vigorous resuscitation and early diagnosis.

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