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ORIGINAL ARTICLE

Current Practice for the Management of Blunt Abdominal Trauma in a Tertiary Care Hospital: A Prospective Study

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ABSTRACT

Aim: To assess the different kinds of management provided to patients with Blunt Abdominal Trauma (BAT) in the surgical department of a tertiary care hospital.

Study design: prospective study

Place and Duration: This study was conducted at Liaquat University of Medical and Health Sciences Jamshoro from March 2021 to March 2022

Methodology: The present study includes 115 patients who presented with blunt abdomen trauma (BAT). The data was collected with the pre-designed questionnaire. Data were collected prospectively from all patients admitted to the hospital with abdominal trauma. The trauma was treated using ATLS (Advanced Trauma Life Support) techniques. Laboratory and imaging investigations were performed to diagnose and manage the patients. SPSS version 21 was used to analyze the data. Descriptive statistics were presented in mean, SD/median, frequency, and percentage.

Results: During the investigation, 115 BAT patients were examined. The average age of the patients was 33.7 ± 7.2 years. Males (n=94, 81.7%) and symptomatic cases (n=108, 94%) made up the majority of the injured patients. More than half of the patients (n=73, 63.5%) had abdominal tenderness when they arrived. The majority of the patients had X-rays (n=87, 75.6%) ultrasound (n=75, 65.2%), lab investigation (n=83, 72.1%) and abdominal CT scan (n=35, 30.4%). Only a few patients died (n=17, 14.8%). Patients were treated conservatively in 83% of cases, while surgical treatments were used in 17% of cases.

Conclusion: Non-operative therapy has become the gold standard for critically stable patients with traumatic injuries. Although non-operative management has a higher risk of failure in patients with multiple solid organ injuries, it should still be used with caution in most critically stable persons who do not have peritoneal symptoms.

Keywords: Accident, Blunt Abdominal Trauma (BAT), Non-operative management, vitally stable.

INTRODUCTION

Trauma or injury refers to body harm caused by an altercation of environmental energy greater than the body's strength. It is seen as a major public health issue worldwide, regardless of socioeconomic status. (1)Depending on the manner of injury, abdominal trauma is categorized as penetrating or blunt. Injury is the 7th leading cause of death worldwide, with the abdomen ranking third among the most often injured organs.(2)Patients with acute abdominal injuries can have a variety of pathophysiologic causes. A hollow viscus can be ruptured by a sudden and significant rise in intra-abdominal pressure caused by outside pressures. Such a system may injure passengers wearing a lap belt without a shoulder attachment if the belt compresses the abdomen too firmly.(3)Sharp forces applied to the front abdominal wall can crush tissue by compressing the abdominal viscera against the posterior thoracic cage or spinal column. Solid organs (i.e., liver and spleen) are more vulnerable to laceration or fracture due to this process.(4) These injuries are more prone to occur in older persons and alcoholics with flexible abdominal walls. It's possible to have a delayed splenic rupture. The duodenum and pancreas, which are retroperitoneal structures, may injured. Slashes of both solid and hollow organs from the peritoneum can be caused by shearing pressures induced by sudden deceleration.(5)They can also produce vascular pedicle tears or stretch damage to the mediaand intima of arteries, leading to infarction of the susceptible organ. The kidney is most commonly affected by Stretch injury. Fractured ribs or pelvic bones can lacerate Intra-abdominal tissue.(6)

In the emergency room, blunt abdominal trauma is common (ED). These injuries can be difficult to detect and treat due to a lack of previous data and distracting injuries or altered mental conditions, such as from a head injury or drunkenness.(7)Blunt trauma victims may have extra-abdominal and abdominal injuries at treatment. Blunt abdominal trauma (BAT) is often overlooked because it is not visible until inspected several times.(8) Abdominal injuries can be fatal if not diagnosed and treated properly. In combination with computed tomography (CT) and abdomen-focused assessment with sonography in trauma (FAST), initial resuscitation is especially useful in finding individuals with limited and clinically unidentified symptoms of an abdominal injury, according to recent care guidelines. (8)If a patient is hemodynamically unsteady and has a positive FAST test, laparotomy should be performed immediately. Ultrasonography should be used to supplement clinical evaluation rather than a primary or secondary intervention. (9)

CT scanning, which allows for the exact detection of solid organ injury, has eased the development of non-operative treatment. Approximately 10% of patients, despite aggressive fluid resuscitation, develop protracted hypovolemic shock and require an emergency laparotomy.(10) Pre-hospital transfer, early assessment, comprehensive resuscitation efforts, and proper diagnosis are crucial in trauma management. With early diagnosis and treatment of fewer than 8 hours, the mortality rate may be lower by 2%. However, 8 to 16 hours delays result in a fourfold increase in the death rate. (11)the present study aimed to identify the practices for managing patients presenting with blunt trauma injuries.

METHODOLOGY

The present prospective study was performed after receiving approval from the institutional ethical review board. A total of 115 patients were involved in the present study. Data was collected using a pre-designed questionnaire from the patients between the ages of 15 and 65years who visited the hospitalemergency surgical department to diagnose blunt abdominal injuries confirmed by ultrasonography. However, penetrating trauma patients, pregnant women, and patients who died on arrival and or left against medical advice during resuscitation were all omitted from this study. Data on all patients hospitalized to the Surgical Department with blunt abdominal trauma were collected prospectively using the Performa software.

Trauma patients that arrived at the emergency room were first resuscitated in the trauma management room using the Advanced Trauma Life Support (ATLS) protocols. When admitted to the emergency room, all patients were examined with x-rays and an ultrasound FAST scan for diagnosis, as is a routine procedure. Patients were thoroughly examined after conducting the first resuscitation and considering hemodynamic stability. On physical examination, BAT was defined as appearing to the emergency department with abdominal discomfort greater than a five on the visual analog scale, soreness, and any road injury or fall. Penetrating abdominal trauma was described as arriving at the emergency department with an open wound in the abdomen area as a result of a firearm injury or stab assault.

Based on the clinical findings, additional observations such as a CT scan of the abdomen and diagnostic peritoneal lavage were performed. During the physical examination and abdomen inspection, bruising, abrasions on the abdomen, and generalized or localized pain. All BAT patients with hemodynamic instability, tenderness, free fluid finding, or peritonitis had an exploratory laparotomy on the FAST. Laparotomy findings in unstable and hemodynamically stable patients in ultrasound results were used to document intra-abdominal solid viscus injuries. Patients' clinical and demographic information on a pre-designed proforma, such as gender, age, body mass index, socioeconomic status, forms of injury, gut sound, and outcome, were recorded. SPSS version 21.0 was used for the analysis of the data. The quantitative variables' mean, standard deviation, and median were calculated based on the data distribution. For each categorical variable, the frequency and percentage were calculated.

RESULTS

During the investigation, 115 blunt abdominal trauma patients were examined. The mean age of the patients was 33.7 ±7.2 years. The majority of the cases were males (n=94, 81.7%) than females (n=21, 18.3%). Whereas 91.7% symptomatic cases and 6% asymptomatic cases were observed in the present study. More than half of the cases had injuries other than the abdomen. Nearly less than half of the subjects (n=46, 40%) had no gut sounds. More than half of the patients (n=73, or 63.5%) had abdominal tenderness when they arrived. The majority of the patients had X-rays (n=87, 75.6 %), ultrasound FAST (n=75, 65.2%), and laboratory tests (n=83, 72.1%). An abdominal CT scan was performed in nearly a quarter of the patients (n=35, 30.4%). The majority of the cases were recovered, while 14.8% of cases died from the injuries (As shown in Table 1). The majority of the cases that arrived in the hospital had road accidents (n=75, 65.2%), followed by fall injuries (n=31, 27%) and assaults (n=9, 7.82%), as shown in Table 2.

Table 1: Study subjects' descriptive statistics

Variables		Frequencies
Mean age (years)		33.7 ± 7.2
Gender	Male	94 (81.7%)
	Female	21 (18.3%)
Symptomatic cases	Yes	108 (94%)
	No	7 (6.0%)
Presence of Gut sound	Yes	69 (60%)
	No	46 (40%)
Abdomen tenderness	Yes	73 (63.5%)
	No	42 (36.5%)
Injuries other than abdomen	Head	14 (12.2%)
	Chest	61 (53%)
	Ribs	17 (14.8%)
	Pelvis	23 (20%)
Other Investigations	X-ray	87 (75.6%)
	Ultrasound (FAST)	75 (65.2%)
	CT scan abdomen	35 (30.4%)
	Lab Investigations	83 (72.1%)
Outcome	Alive	98 (85.2%)
	Dead	17 (14.8%)

Table 3 describes the frequency of approaches utilized for patient treatment in which conservative management was provided to 83% of patients, whereas 17% received non-conservative treatment.

Table 2: Description of the cause of blunt trauma accident

Cause of Injury	Frequencies
Road Accidents	75 (65.2%)
Assaults	9 (7.82%)
Fall	31 (27%)

Table 3: Description of management provided to the patient in a hospital

Type of management	Frequency
Non-Conservative	20 (17%)
Conservative	95 (83%)

DISCUSSION

Blunt abdominal trauma is caused by direct contact of a blunt instrument with a body. The majority of serious traumatic injuries resulting from blunt trauma are pedestrian accidents and car accidents. Falls are another common cause, especially among the elderly. Other, more visible exterior injuries can sometimes obscure clinical examination of blunt abdominal injuries.(12) With the adequate and timely request of imaging modalities in BAT patients and physical evaluation, nontherapeutic laparotomies have been dramatically reduced. After a trauma, unrecognized abdominal damage is a common cause of avoidable death.(13) In the present study, 115 BAT patients were examined. The average age of the patients was 33.7 ± 7.2 years. Comparable results were observed in a study conducted by Mehta et al. (2014) showed that 40% of the patients were between 21 and 30 years. One possible reason for the effect on the young population is the high rate of traffic and industrial trauma in emerging nations such as Pakistan. The majority of the cases in our study were males, 81.7%, and the greatest cause was accidents related to road traffic. Similar observations were carried out by a study in which the male ratio was higher than females, and the major cause of BAT was road accidents. (14)

FAST was conducted in 65.2% of patients in this study, while a CT scan abdomen was performed in 30.4% of patients. Radwan et al. (2006) showed that FAST is valuable for detecting intraabdominal fluid in abdominal injuries. Diagnostic peritoneal lavage indications are becoming more limited. CT scanning is the diagnostic modality of choice in hemodynamically stable patients. (15) Few other studies have also indicated that ultrasonography is a feasible alternative to CT scans, which are considered the gold standard in radiology.(16) Many extra-abdominal injuries have been linked to abdominal injuries. In the present study, Chest wall extra-abdominal injury (53%) was the most commonly observed, followed by Pelvis (20%) and rib fractures (14.8%). Similar findings were observed by Gad et al. (2012), where chest injuries accounted for 34.1%, damage to the extremities was 51.2%, and head and neck injuries accounted for 14.6% of BAT cases. Likewise, Arumugam et al. (2015) reported that chest injuries are the most common upper extra-abdominal injuries in polytrauma patients, followed by limbs and head injuries.(17) In our study, 83% of patients received conservative treatment, whereas 17% required surgery.Karamercanet al. (2008) showed in their study that 14.5% of total abdominal injury cases went through laparotomies. (18) A study carried out by Hashemzadehet al. (2010) showed out of 98 patients, six went through laparotomy due to the failure of NOM, whereas 92 patients were managed successfully with consecutive management. (19) Studies over the last three decades have found that NOM for solid organ injury is effective, withmore than 90% informedattainment. (20) Mortality rate in the present study was 14.8%. Another study observed a mortality rate of 15% in their study. (21)Okus et al. (2013) observed a mortality rate of 4.3%. (22) According to Musauet al. (2005), 12.5% of patients with abdominal injuries died. (23) As per Arumugam S et al., cause-specific mortality was quite high, with serious head injuries of 58% and

sepsis accounting for the bulk of deaths of 33%. (17) The limitation of the study was the reduced sample size. Similar studies with a larger number of patients from different hospitals should be used to evaluate the various management techniques and procedures more specifically.

CONCLUSION

Non operative management has become the gold standard for critically stable patients with traumatic injuries. Although non operative management has a higher risk of failure in patients with multiple solid organ injuries, it should still be used with caution in most critically stable persons who do not have peritoneal symptoms.

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