Original Article

Practices of Blunt Abdominal Trauma in a Government Tertiary Care Hospital, Karachi, Pakistan

Different Kinds of Management with Blunt Abdominal Trauma

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ABSTRACT

Objective: To determine the frequencies of different kinds of management provided to the patient presented with blunt abdominal trauma (BAT) in a government tertiary care center in Karachi, Pakistan.

Study Design: prospective descriptive analytic study

Place and Duration of Study: This study was conducted at the Surgical Department, Abbasi Shaheed Hospital Karachi from July 2019 to July 2021.

Materials and Methods: The data was captured using a pre-designed and pre-tested questionnaire. Data of all patients admitted in hospital diagnosed with blunt abdominal trauma were prospectively collected. Advance Trauma Life Support (ATLS) protocols were used to treat the trauma. Laboratory and imaging investigation were done to make diagnosis and manage patients. Data was entered and analyzed using SPSS version 26.0. Descriptive statistics were reported in terms of mean ± SD/median, frequency and percentage where appropriate

Results: Total 84 BAT patients were reviewed during the study period. Mean age of patients was 31.3 ± 12.2 years. Majority of the injured patients were males (n=73, 86.9%) and were symptomatic cases (n=77, 91.7%). More than half of the cases had injuries other than abdomen as well (n=53, 63.1%). Abdomen was tender on presentation among more than half of the patients (n=51, 60.7%). X-ray (n=60, 71.4%), ultrasound fast (n=54, 64.3%) and laboratory investigations (n=54, 64.3%) were done for majority of the patients. CT-scan for abdomen was performed in nearly quarter of the patients (n=25, 29.8%). Few patients did not survive (n=10, 11.9%). 78.6% of patients were treated conservatively and 21.4 % of patients underwent surgical interventions

Conclusion: For vitally stable patients with blunt injuries, non-operative therapy has become the gold standard. Although NOM has a greater failure probability in patients with multiple solid organ injuries, in most vitally stable individuals who do not have peritoneal symptoms, it can still be taken with caution.

Key Words: Blunt abdominal trauma (BAT), hemodynamically or vitally stability, non-operative management (NOM), Injury, Focused assessment with sonography in trauma (FAST)

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INTRODUCTION

Trauma or injury is defined as bodily harm induced by an exchange of environmental energy larger than the strength of body[1]. It is seen as a major public health problem worldwide, regardless of socioeconomic background[2]. Abdominal trauma is classed as penetrating or blunt depending on the mechanism of injury[3]. Injury is the seventh biggest reason of death worldwide, and the abdomen is the third highest commonly injured organ[3].

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Blunt abdominal trauma (BAT) is missed because it is usually not obvious unless examined multiple times. Diagnosis delay and insufficient management of abdominal injuries may become lethal. Initial resuscitation, in combination with focused assessment with sonography in trauma (FAST) and computed tomography (CT) abdomen, is particularly helpful in detecting individual with limited and clinically unidentifiable indications of abdominal injury, and is recommended in recent care guidelines[4]. A patient who is hemodynamically unstable and has a positive FAST exam should undergo laparotomy right away. Ultrasonography is an adjunct of the clinical evaluation and should not intervene with primary and secondary intervention. The development of non-operative treatment has been aided by the use of CT scanning, which enables for precise identification of solid organ injury. Approximately 10% of patients experience prolonged hypovolemic shock despite vigorous fluid resuscitation and need an emergency laparotomy. There has been a growing trend toward non operative

management (NOM) of blunt abdominal trauma, which now accounts for 80% of cases with failure rates ranging from 2% to 3%. For vitally stable solid organ injuries, NOM is a routine treatment[4]. NOM of blunt splenic damage has reported success rates of 95 percent or higher in children and around 80 percent or greater in adults[5]. The majority of this data, on the other hand, comes from retrospective research, and it focuses on the failure percentage of single intra-abdominal solid organs trauma treated non-operatively. Despite the fact that NOM has a greater failure rate in cases of multiple solid organ injury, it should be used with caution in these cases[6].

In trauma management, pre-hospital transfer, initial examination, complete resuscitative efforts, and accurate diagnosis are critical. The mortality rate was only 2% with timely diagnosis and treatment (within 8 hours), however delays of 8 to16 hours resulted in a 9% mortality rate (a four-time increase), and when these injuries were detected >24 hours after admission, the mortality rate was 31% (a 15-time increase)[7].

MATERIALS AND METHODS

This prospective descriptive study was conducted at surgical department of Abbasi Shaheed Hospital Karachi after approval from the institutional ethical review board. The data was captured using a pre-designed and pre-tested questionnaire. The study included patients of either gender between the ages of 20 and 60 who arrived to the emergency with a diagnosis of blunt abdominal trauma confirmed by ultrasound. Individuals with penetrating trauma, those who died on arrival, pregnant women, and those who left during resuscitation against medical advice were all excluded from the present study. Data of all patients who were admitted in Surgical Department of Abassi Shaheed hospital diagnosed with blunt abdominal trauma from July 2019 to July 2021 were prospectively collected with designed Performa.

Trauma patients presented to emergency department were firstly resuscitated at trauma management room following the Advance Trauma Life Support (ATLS) protocols. All patients were investigated by x-ray examinations & ultrasound FAST scan for diagnosis when admitted to emergency as per standard procedure. After performing first resuscitation and considering the hemodynamic stability, patients were carefully assessed. Further investigations such as diagnostic peritoneal lavage and CT Scan abdomen were done based on clinical finding. Physical examination and abdomen examination findings included abrasions, bruising on abdomen, localized or generalized tenderness. An exploratory laparotomy were conducted in all BAT patients with peritonitis, tenderness, hemodynamic instability, or a free fluid finding on the FAST. Intra-abdominal solid viscus injuries were documented on ultrasound in hemodynamically stable patients and laparotomy findings in unstable patients. Patients' clinical and demographic characteristics that included age, gender, socio-economic status, types of injury, presence of gut sound, body mass index and final outcome were recorded on pre-designed Performa. Data were entered and analyzed using SPSS version 26.0. Mean ± SD/Median were computed for the quantitative variables based on the distribution of data. Normality of the data were checked by Shapiro- Wilk test. Frequency and percentage were computed for all the categorical variables**.**

RESULTS

Total 84 BAT patient were reviewed during the study period. Mean age of patients was 31.3 ± 12.2 years.

Table No.1: Descriptive statistics of study subjects

Variables	**Frequency (%)**
Age (in years)[#]	31.3 ± 12.2
Gender	
Male	73(86.9)
Female	11(13.1)
Symptomatic cases	
yes	77(91.7)
no	7(8.3)
Injuries other than abdomen	
yes	53(63.1)
no	31(36.9)
Presence of gut sounds	
yes	60(71.4)
no	24(28.6)
Abdomen tenderness	
yes	51(60.7)
no	30(35.7)
not examined	3(3.6)
Abdominal wall sign	
yes	31(36.9)
no	53(63.1)
Injuries other than abdomen	
Head	11(13.1)
Chest wall	42(50)
Ribs	13(15.5)
Pelvis	18(21.4)
Investigations done	
X-ray	60(71.4)
Ultrasound fast	54(64.3)
laboratory investigations	54(64.3)
CT-scan for abdomen	25(29.8)
Outcomes	
alive	74(88.1)
dead	10(11.9)

#: Age is presented as mean ± standard deviation

Majority of the injured patients were males (n=73, 86.9%) and were symptomatic cases (n=77, 91.7%). More than half of the cases had injuries other than abdomen as well (n=53, 63.1%). Nearly quarter of the

participants had no gut sounds (n=23, 27.4%) and abdominal wall sign was present in 31 (36.9%) patients. Abdomen was tender on presentation among more than half of the patients (n=51, 60.7%) (Table 1). Figure 1 shows the frequency of injury mode.

X-ray (n=60, 71.4%), ultrasound fast (n=54, 64.3%) and laboratory investigations (n=54, 64.3%) were done for majority of the patients. CT-scan for abdomen was performed in nearly quarter of the patients (n=25, 29.8%). Few patients did not survive (n=10, 11.9%) (Table 1). Figure 2 shows the frequency of approach used for the management of the patients.

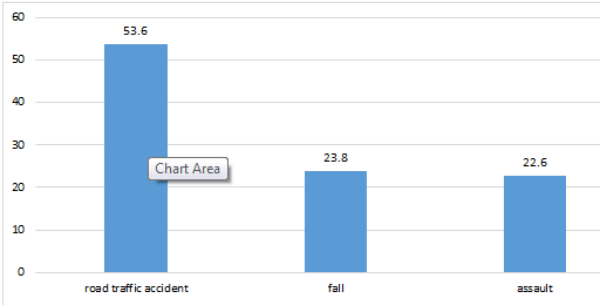

Figure No.1: Frequency of injury mode

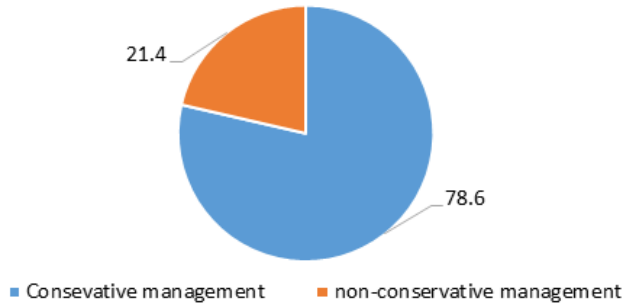

Figure No.2: Types of management provided to blunt abdominal Injury patients

DISCUSSION

Total 84 BAT patients were reviewed during the study period. Mean age of patients was 31.3 ± 12.2 years. This is in accordance with a research conducted by Mehta et al. they reported that 40% of patients who sustained BAT were between the age of 21-30 years[8]. One possible reason for affecting young population is that in developing countries, such as Pakistan, have a high rate of traffic and industrial trauma. We observed that the majority of the injured cases were males. This is in line with the researches of Mehta et al[8] and Bushra Khan et al[1]. Road traffic accidents (RTA) were the most frequent source of abdominal injury in our analysis, followed by falls. This is in accordance with the research of Mehta et al. They reported motor-vehicle accidents were responsible for 53% of all trauma cases[8].

In the present study FAST was performed in 64.3 % of patients while CT Scan abdomen were performed in 29.8 % of patients. Ultrasonography, has been shown in some studies to be a viable alternative to CT scans, which are regarded as the gold standard in the field of radiology. In a randomized analysis, Rose et al. found that 52% of the control group (who did not get ultrasound in the casualty room) eventually had CT, in comparison to just 36% of the ultrasound group. They came to the conclusion that evaluating patients with blunt abdominal injuries by utilizing with abdominal ultrasound could reduce the CT scan need[9,10]. In a study conducted on 4,029 participants, 122 were hypotensive at the time of admission, Lee et al. found that FAST ultrasonography showed 85% sensitivity, 60% specificity, and 77% accuracy in forecasting the requirement for surgery in the hypotensive cohort. Finally, researchers observed that in hypotensive patients with acute abdominal injuries, a positive FAST ultrasound may result in direct triage to therapeutic laparotomy without the necessity for a CT scan of the abdomen[10]. Miller et al., in contrast to these results, suggested that using FAST ultrasonography as a screening technique in hemodynamically stable patients may lead to a misdiagnosis of intra-abdominal injuries, putting the therapy and outcome at danger. As a result, such patients must get a CT scan on a regular basis[11].

To rule out extra-abdominal injuries, the surgeon should seek for additional sources of trauma. Abdominal injuries were associated to a variety of extra-abdominal injuries. In our study the most prevalent accompanied extra-abdominal injuries, were chest wall (50%), Pelvis (21.4%) and rib fractures (15.5%). Similarly, Arumugam S et al[2] also discovered that chest injuries to be the most commonly related upper extra-abdominal injuries in polytrauma patients followed by limbs and head injuries. Furthermore, Mehta et al. also discovered that rib fractures (20 percent) and soft tissue injuries (20 percent) were the most common extra abdominal injuries in their study[8].

In our research, 78.6% of patients were treated conservatively, while 21.4 percent required surgical intervention. According to Arumugam S, et al[2], 27% of their patients had laparotomies. Another Turkish study found that emergency laparotomies were performed in 13% of blunt abdominal trauma cases[12]. Howes, et al observed that 8% of trauma victims with abdominal injury needed a laparotomy[13]. Multiple researches indicated that NOM for solid organ injury is beneficial amid the last three decades, with a reported success rate of >90%[14,15].

Eelderliness, ISS, and cerebral injury may all have an impact on NOM's success rate, among other variables[15,16]. In a study of 558 individuals with traumatic splenic injury conducted at a single institute, found that NOM failed in 22% of patients who were above 55 years, compared to 6% of patients under 55 years[16]. In practically all instances, Bee et al.7 found that the failure rate was independently determined by ISS[16].

In numerous researches, the reasons of failure have been explained in various ways. One-third of patients had failure due to causes other than solid organ injury, according to Velmahos et al[17]. Bicycle collision were linked to a higher risk of NOM failure, according to Holmes et al[18], who also discovered that In isolated organ injury, the percentage of NOM failing was 10.9-o 38.2%, whereas in multiple organ injury, it was 54.4-70%.

Mortality in our study was 11.9%. Musau et al[19] found that 12.5% of patients with abdominal injuries died. Another prospective study on blunt abdominal injuries found a 26% overall death rate, with half of the patients dying from sepsis-related multiple organ failure[13]. Mortality rate ranged from 2.4% to 4 % in other studies[2,8]. The rationale for the greater risk of mortality in our study could be due to patients' delayed presentation. Arumugam S et al. also reported that, cause-specific mortality was rather high, with serious head injuries (58%) and sepsis accounting for the majority of deaths (33%).

This study has various limitations, the sample size is very small, and needs to be increased. A larger sample size is required to truly evaluate the various management procedures for the treatment of blunt abdominal trauma and their rate of success.

CONCLUSION

For vitally stable patients with blunt injuries, non-operative therapy has become the gold standard. Although NOM has a greater failure probability in patients with multiple solid organ injuries, in most vitally stable individuals who do not have peritoneal symptoms, it can still be taken with caution.

Author's Contribution:

Concept & Design of Study:	Aqsa Ismail
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Final Approval of version:	Aqsa Ismail, Ayesha Tasneem

Conflict of Interest: The study has no conflict of interest to declare by any author.

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