



Epidemiology And Clinical Features Of Patients Presenting With Blunt Abdominal Trauma: A Experience From A Tertiary Care Center Of North India

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Abstract

Background: Trauma kills more than 4.8 million people every year and accounts for 10.1% of the global burden of diseases. Abdomen is the third most common injured region and blunt abdominal trauma is often missed because clinical signs are less obvious.

Objectives: Present study was aim to analyze the epidemiology and clinical feature of patients presenting with blunt abdominal trauma at a tertiary care center of north India.

Methodology: Total 92 patients presented to department of surgery with clinical evidence of abdomen trauma were included in this study. Sociodemographic and clinical parameters were analyzed using a pre-designed semi-structured proforma.

Results: The mean age of the patients was 33.65 ± 8.79 years with majority of males. Road accident is the most common mode of injury revealed in 60.9% patients followed by fall from height and assaults. The mean GCS score was 14.84 ± 0.41 . Solid organ injury was encountered in 90.2% patients whereas hollow organ injury was found in 9.8% patients. Most common injured organs were liver, kidney and spleen. Conservative treatment was adopted in 76.1% cases whereas surgery was performed in 23.9% cases. The mean hospital

stay was 8.03 ± 6.28 days. Mortality encountered 6.5% cases whereas 93.5% patients were discharged successfully.

Conclusion: Present study highlighted that road safety standards are need to adopt to reduce the risk of blunt abdomen trauma. Dedicated medical services to deal with the trauma is need to be establish at secondary health care centers so that patients could be handled well before they reach to tertiary care center.

Keywords: Trauma, Road accident, Abdomen, Surgery, Injury.

Introduction

Trauma is a big health problem in both the developed and developing countries. Trauma kills more than 4.8 million people every year and accounts for 10.1% of the global burden of diseases. It is the commonest cause of mortality in the first forty years of life and is the third most common cause of death overall (1). Abdomen is the third most common injured region. Abdominal trauma is traditionally classified as either blunt abdominal or penetrating abdominal trauma (PAT). PAT is mostly diagnosed reliably and easily, whereas blunt abdominal trauma (BAT) is often missed because clinical signs are less obvious. Mortality in major BAT reported to be as high as 36%. Commonly people of most productive and active age group are involved in BAT (2).

Delay in diagnosis can be dangerous to the patient and can affect the overall morbidity and mortality. Proper understanding of etiology and pattern of blunt abdominal trauma can help in improving the final outcome. In order to decrease mortality in cases of abdominal injury, risk factors for mortality need to be systematically pointed out and studied. The profile and pattern of abdominal trauma is changing with time as Countries are passing through significant increase in urban population, faster vehicle on roads, industrialization and a change in the socioeconomic values. India is changing similar to other countries. Due to these changes, road traffic accidents (RTAs) have become one of the most common problems in the world, which is resulting in loss of large number of untimely human lives (3).

Countries all over the world implemented strict traffic rules and use of helmets, seatbelts, and automobiles are also having safety features like air bags, this has changed the pattern of injuries in RTAs but the injuries due to road traffic related trauma are worsening each year. The use of motor vehicles is increasing globally, a particular concern is in developing economies like

India, where increasing urbanization, narrow roads, overcrowding on roads and poor follow up of traffic rules is prevalent. We are lacking epidemiological data regarding this problem from this part of the country (4).

Worldwide as well as regional variations in the etiology of abdominal trauma are well documented in the literature. Most of abdominal injuries are avoidable. Risk factors are required to be studied so that preventive actions are planned. This study would help to prepare a database in our set up and look into the pattern of abdominal trauma, make an etiological correlation of abdominal trauma with the types of injuries and compare the data with the other available national and international data.

Methodology

Study design: Present study was a prospective, observational, single centric, descriptive and hospital-based study conducted at the department of surgery at a tertiary care center of north India. Total 92 patients presented to department of surgery with clinical evidence of abdomen trauma were included in this study.

Data collection: A pre-designed semi-structured proforma was used for collecting information for the study. Patients and/or their attendants/care-givers were interviewed regarding circumstances, mode, mechanism of trauma and treatment given in the pre-hospital phase. Patients who were admitted in the surgery department were, followed up for determining the duration of hospital stay, complications and outcome.

Statistical analysis: The statistical analysis was carried out using SPSS 27.0. For quantitative variables, mean and standard deviation was used as measures of central tendency and variability respectively. For qualitative variable, fraction of total and percentages was calculated.

Results

The mean age of the patients was 33.65 ± 8.79 years. Among total 92 patients, 25 (27.2%) patients were female and 67 (72.8%) patients were male. Total 62 (67.4%) patients belong to the rural area whereas remaining 30 (32.6%) patients belongs to the urban area. Only 5 (5.4%) patients revealed the history of past injury whereas remaining 87 (94.6%) patients do not have any history of previous injury (Table 1).

Variable	Subdomain	Mean or N	SD or Percent
Mean age		33.65	8.79
Gender	Male	67	72.8
	Female	25	27.2
Locality	Rural	62	67.4
	Urban	30	32.6
History of previous injury	No	87	94.6
	Yes	5	5.4

Table 1: Sociodemographic determinants of the patients.

Road accident is the most common mode of injury revealed in 56 (60.9%) patients, followed by fall from height in 24 (26.1%) cases, assaults in 11 (12%) cases and one rare case of bear attack was also encountered. The mean time to reach the hospital from the time of injury is 2.61 ± 1.62 hours. Abdominal examination revealed distension in 40 (36.8%) patients, guarding in 27 (24.84%) patients, tenderness in 71 (65.32%) patients, rigidity in 22 (20.24%) patients, and softness in 11 (10.12%) patients. Pallor was observed in 22 (23.9%) patients. The mean GCS score was 14.84 ± 0.41 (Table 2).

Variable	Subdomain	Mean or N	SD or Percent
Mode of injury	Road accident	56	60.9
	Fall from height	24	26.1

	Assaults	11	12.0
	Bear attack	1	1.1
Time to reach hospital		2.61 hours	1.62 hours
Abdominal examination	Distension	40	36.8
	Guarding	27	24.84
	Tenderness	71	65.32
	Rigidity	22	20.24
	Soft	11	10.12
Pallor	No	70	76.1
	Yes	22	23.9
GCS Score		14.84	0.41

Table 2: Clinical examination of the patients.

Solid organ injury was encountered in 83 (90.2%) patients whereas hollow organ injury was found in 9 (9.8%) patients. Injured organ involved spleen in 31 (33.7%) patients, liver in 25 (27.2%) patients, kidney in 14 (15.2%) patients, small bowel in 6 (6.5%) patients, mesentery tear in 4 (4.4%) patients, large bowel in 4 (4.3%) patients, adrenal in 3 (3.3%) patients, pancreas in 3 (3.3%) patients, and omentum in 2 (2.2%) patients (Table 3).

Variable	Subdomain	Mean or N	SD or Percent
Type of Injury	Solid Organ Injury	83	90.2
	Hollow Organ Injury	9	9.8
Injured organ	Spleen	31	33.7
	Liver	25	27.2
	Kidney	14	15.2
	Small bowel	6	6.5
	Mesentery tear	4	4.4
	Large bowel	4	4.3
	Adrenal	3	3.3
	Pancreas	3	3.3
	Omentum	2	2.2

Table 3: Type of injury and injured organs.

Conservative treatment was adopted in 70 (76.1%) cases whereas surgery was performed in 22 (23.9%) cases. The mean hospital stay in all 92 cases was 8.03 ± 6.28 days. Mortality was encountered in 6 (6.5%) cases whereas 86 (93.5%) patients were discharged successfully (Table 4).

Variable	Subdomain	Mean or N	SD or Percent
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Treatment protocol	Conservative	70	76.1
	Surgery	22	23.9
Hospital stays		8.03 days	6.28 days
Outcomes	Mortality	6	6.5
	Discharge	86	93.5

Table 4: Treatment protocol, hospital stay and outcomes.

Discussion

Even the most skilled traumatologists find it difficult to treat BAT. BAT can result in injuries ranging from single organ to mutilating multi organ damage. The clinical assessment of BAT may occasionally be obscured by other, more glaring exterior injuries. With adequate and timely application of imaging modalities in BAT patients together with physical assessment, non-therapeutic laparotomies have been dramatically decreased. After trauma, unrecognised abdominal damage is a common cause of avoidable mortality (5).

In this study most common mode of injury was RTA (60%) which is consistent with the findings in similar study by Umare et al., who also reported that RTA were the most common mode of injury (52%) followed by fall from height (28%) and assault (20%). Chalya et al., also reported that 69.5% injuries were due to RTA (6). Kulkarni et al., reported RTA responsible for injuries in 75% cases (7). According to Balamurugan et al., 68% injuries were due to RTA (8). Similar findings were made by Khanna et al, who discovered that road traffic accidents were the most frequent cause of injury in BAT cases (57%) (9). Distribution according to type of injury consisted of maximum cases, 84 (84%) of road traffic accidents, 11% cases were of fall from height in the study by Shram and Bhargav (10). Easy access to automobiles, rising vehicle and population numbers, a lack of familiarity with traffic, poor traffic sense, and disregard for safety measures that results in increasing congestion on the roads can all be directly linked to a rise in traffic accidents. Because of the rising population and number of cars, which increased traffic and congested the roads, the majority of traffic accidents happened in metropolitan areas. This also involves a lack of understanding of traffic laws and a population shift into metropolitan areas in search of employment (11).

Abdomen distension (36.8%) and abdominal tenderness (65.32%) were the commonest finding in our study and were comparable to similar studies in the past. Abdominal distension may be due to ruptured hollow viscous, paralytic ileus or due to bleeding in the peritoneal cavity. Results of present study is consistent with a study by Kulkarni et al. who reported abdominal distension in 26% cases (7). Panchal et al. and Maske et al., have also documented a higher incidence of abdomen distension (12, 13). Hence patients who are having abdominal tenderness and distention have to be monitored carefully and investigated for blunt injuries of abdomen.

In this study, the mean GCS score was 14.84 ± 0.41 . This result is comparable with study by Hoeg et al., in which GCS score was in between 13 to 15 in 85% cases (14). It is well known that clinical examination cannot be done reliably for a patient in which consciousness is impaired (lower GCS). This is particularly

important in BAT, where there may be no injury marks externally, Consciousness may be impaired (lower GCS) because of associated head injury or due to sedatives used during endotracheal intubation. According to a study by Parriera et al, group without intra-abdominal organ injuries was having meaner GCS at presentation (12.3) as compared to group having intra-abdominal organ injury (10.9) (15). So low GCS patients at presentation should be carefully investigated and observed for intra-abdominal organ injuries and associated other body region injuries.

In our investigation, solid organ damage was shown to be more prevalent in 83 cases (90.2%). Similar findings have also been found in studies by Panchal et al. and Balamurugan et al. (8, 12). According to a research by Maske et al., SOI and HWI were each present in 50% of patients (13). Spleen injuries were the most prevalent organ in our analysis, accounting for 31 (33.7%) cases. Lima et al and Panchal HA et al have shown that liver is the commonest organ injured (12, 16). Additionally, studies have revealed that in individuals with abdominal trauma, the small bowel suffers the most hollow viscous injuries (12).

Total 76.1 percent of the participants in our research were treated conservatively. Since solid organ damage was the most frequent injury in our research, the majority of patients received a conservative treatment plan that included intensive patient monitoring. Only a few additional research have reported the same managerial strategy. The proportion of patients handled conservatively, however, differed in various research. In a research by Reddy et al., 66 percent of patients underwent a conservative approach, whereas 34 percent underwent surgery (17). 63 percent of patients in a research by Malhotra et al. were handled conservatively, whereas 37 percent of patients were addressed surgically (18). According to a Tanzanian research by Chalya et al., 49 percent of patients were treated surgically (6).

In the present study most of the cases stayed in hospital for up to 10 days (84.8%) which is comparable to studies by Ramya et al which reported up to 10 days hospital stay in 48%, Dodia et al reported up to 10 days hospital stay in 80% cases, and Vashistha et al up to 10 days hospital stay in 45% cases (19-21). But Jain et al., study in contrast shows most of the cases were staying between 11 to 20 days (54%) (22). This is due to the fact that the Jain et al. study included 100 cases of abdominal trauma, all of which had hollow viscous injuries and were treated surgically, necessitating a lengthier hospital stay.

In our study, abdominal trauma patients had a death rate of 6.5%. The death rate in the research by Thapa et al. is 9.3% (23). Because GI injuries made up 51% of the sample by Thapa et al. and PAT was 35%, the total death rate is greater. In the study by Walia et al, the death rate is 8% (24). Mortality in the research by Jain et al. was 7%. (22). The death rate in the study by Chalya et al. was 18% (6). The fact that most cases in our research arrived at our hospital after receiving first aid at other medical institutions and that patient who were seriously injured could have passed away before arriving at IGMC accounts for the lower mortality in our study.

Conclusion

Present study was a prospective, single centric, observational, and hospital-based study conducted with aim to evaluate the epidemiology and clinical features of patients presenting with blunt abdominal trauma at IGMC, Shimla. Total 92 cases of blunt abdomen trauma were analyzed in this study. Road accident is the most common mode of injury followed by fall from height, assaults and one rare case of bear attack. Majority of patients were represented with solid organ injuries with spleen and liver as most common injured organ. In most of the patients, conservative treatment was adopted. Mortality was occurred only in few cases and majority of the cases were successfully discharged. Present study highlighted that road safety standards are need to adopt to reduce the risk of blunt abdomen trauma. Dedicated medical services to deal with the trauma is need to be establish at secondary health care centers so that patients could be handled well before they reach to tertiary care center.

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