

ORIGINAL RESEARCH

To determine the blunt abdominal trauma and its complications at a tertiary care centre in Gujarat

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ABSTRACT

Aim: To determine the blunt abdominal trauma and its complications at a tertiary care centre in Gujarat. **Materials and methods:** The results of this research were based on the participation of fifty people who had had abdominal injuries. Individuals who had suffered acute abdominal injuries were admitted to the hospital and received medical care there. In addition to a physical examination, a comprehensive clinical history, X-rays, and laboratory testing, an ultrasound was performed in order to come at a conclusion on the patient's condition. **Results:** The most prevalent clinical manifestation was pain in the abdomen, which occurred in 86% of instances. This was followed by abdominal guarding and stiffness, which occurred in 78% of cases, followed by distension (54%), shock (32%), and hematuria, which occurred in 4% of cases. The liver was the most often wounded organ, occurring in 14 (28%) of the cases, while the spleen was the second most frequently injured organ, occurring in 8 (16%) of the cases. In 14% and 12% of the patients, respectively, the small bowel and retro peritoneum were damaged. Damage to the kidney occurred in 10% of instances, injury to the large bowel occurred in 6% of cases, injury to the mesentery occurred in 6% of cases, injury to the diaphragm and bladder occurred in 4% of cases and 2% of cases respectively, and injury to the pancreas occurred in just 2% of cases. Out of 50 instances, conservative treatment was used for 30 (60%) of them, whereas surgical treatment was used for 20 (40%) of them. **Conclusion:** According to the findings of this study paper, blunt abdominal trauma is a significant source of morbidity and death in young patients, with road traffic accidents being the most prevalent contributing factor.

Keywords: Abdominal trauma, Injuries, liver, Road traffic accidents

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INTRODUCTION

Trauma is a worldwide epidemic that kills more than 5 million people every year and is responsible for 9% of the world's deaths. This figure is roughly 1.7 times as high as the number of fatalities that arise from HIV/AIDS, TB, and malaria combined. ¹ Low- and middle-income nations are responsible for 90 percent of the world's fatalities caused by trauma. The 30-day death rate associated with trauma is twice as high in India as it is in nations with high incomes, and the trend of in-hospital mortality has not showed any signs of improvement over the course of the last decade despite advancements in imaging and medical technology. ² The abdomen is the third most often wounded part of the body. It is impacted in seven to

ten percent of people who have been harmed, and eighty-five percent of abdominal trauma is caused by blunt force. ³ The term "blunt abdominal trauma," or BAT, may refer to an injury that occurs on its own or in conjunction with other traumas. If BAT is not detected and sought for, it is possible that it will not be found, which would dramatically increase the morbidity and mortality of trauma sufferers. ³ The clinical assessment on its own is often insufficient since there may be an accompanying change in mental state as a result of shock or head injury; or other evident injuries may attract the attention of the examining clinician. Accidents involving motor vehicles, falls, and violent acts are among of the most prevalent triggers of BAT. ³ Although though any

internal organ might be harmed by a blunt trauma to the abdomen, the liver and spleen are the ones that suffer the greatest damage.⁴

The majority of the instances end up being deadly as a result of a delay in diagnosis as well as insufficient treatment of the abdominal injuries. As a result, one of the primary purposes of the examination is to arrive at a correct diagnosis and stay away from unnecessary surgical procedures.⁵ Around twenty-five percent of civilians who sustain stomach injuries may need to undergo surgery.⁶ The majority, or 75%, of occurrences of blunt abdominal injuries are caused by motor vehicle accidents. In patients who have suffered blunt abdominal trauma, unrecognised intra-abdominal damage continues to be a distressingly common cause of mortality that might have been avoided.⁷ Since the clinical indications of blunt injuries are less visible, they are often overlooked. Injuries to the abdomen that are caused by blunt force may cause damage to the liver, spleen, pancreas, gut, and intestines, in addition to possibly causing bleeding or contusions. Age, gender, and the amount of time that passes between an injury and when it is treated are three of the most important risk variables in predicting death rates. This research has been chosen to study the cases of blunt abdominal trauma with the aim, to evaluate the incidence of blunt injury abdomen, clinical presentation, morbidity, and mortality in tertiary care centre in Gujarat. Considering the growing number of vehicles and, as a result, RTAs, this research has been chosen to study the cases of blunt abdominal trauma.

MATERIALS AND METHODS

The Department of Surgery was the one to carry out this particular investigation. The results of this research were based on the participation of fifty people who had had abdominal injuries. Individuals who had suffered acute abdominal injuries were admitted to the hospital and received medical care there. In addition to a physical examination, a comprehensive clinical history, X-rays, and laboratory testing, an ultrasound was performed in order to come at a conclusion on the patient's condition. Collecting demographic data such as an individual's age, gender, employment, as well as the kind of accident that led to the injury and the time it occurred.

INCLUSION CRITERIA

Patients older than 18 years old, admitted with a history of blunt abdominal trauma, road traffic accident with suspected blunt abdominal injury, findings such as diagnostic peritoneal lavage or hemoperitoneum on Focused Assessment with Sonography for Trauma (FAST), blunt trauma abdomen in sports injury, uncontrolled shock or haemorrhage, history of accidental fall from height, story of fall of the heavy object over the abdomen, undergoing surgical intervention, or treated by non-operative management were included in the study.

EXCLUSION CRITERIA

Patients who had injuries such as penetrating wounds, gunshot wounds, or stab wounds, as well as patients who were in the paediatric age category, were not included in the research.

STATISTICAL ANALYSIS

The gathered information was then given a numerical coding, imported into Microsoft Excel 2010, and subjected to statistical analysis. The socio-demographic pattern, the manner of damage, and the organs involved in patients who experienced blunt injury abdomen were factors whose data were evaluated using descriptive statistics such as frequencies and percentages evaluation.

RESULTS

In the present investigation, there were a total of 50 patients who had suffered abdominal organ trauma as a result of blunt force. According to the findings of our research, the majority of patients (70%) were male, and just 15 were female. The ratio of males to females was 2.33 to 1, and the majority of patients were in the age range of 30 to 40 years old (52%), followed by the age range of 40 to 50 years old (22%). The average patient's age was 38.25 years. Table 1. According to Table 2 of the research paper, the author discovered that road traffic accidents were the most prevalent cause of blunt trauma to the abdomen, accounting for 30 (60%) of the cases. The next most common cause was a fall from a height, accounting for 13 (26%) of the cases. Additional reasons included being struck by blunt objects and being assaulted, totaling seven (14%). The most prevalent clinical manifestation was pain in the abdomen, which occurred in 86% of instances. This was followed by abdominal guarding and stiffness, which occurred in 78% of cases, followed by distension (54%), shock (32%), and hematuria, which occurred in 4% of cases. Table 3. According to Table 4, the liver was the most often wounded organ, occurring in 14 (28%) of the cases, while the spleen was the second most frequently injured organ, occurring in 8 (16%) of the cases. In 14% and 12% of the patients, respectively, the small bowel and retro peritoneum were damaged. Damage to the kidney occurred in 10% of instances, injury to the large bowel occurred in 6% of cases, injury to the mesentery occurred in 6% of cases, injury to the diaphragm and bladder occurred in 4% of cases and 2% of cases respectively, and injury to the pancreas occurred in just 2% of cases. Table 5 shows that out of 50 instances, conservative treatment was used for 30 (60%) of them, whereas surgical treatment was used for 20 (40%) of them. According to the findings of this research, the most prevalent cause of death was cardiorespiratory failure, which accounted for 6% of all cases. Table 6 shows that 2% of the deaths were caused by septicemia, another 2% by shock, and 2% by renal failure.

Table 1: Age and gender

Gender	Number	%
Males	35	70
Females	15	30
Age group (years)		
below 30	10	20
30-40	26	52
40-50	11	22
above 50	3	6

Table 2: Causes of blunt trauma abdomen

Causes	Number	%
Road traffic accidents	30	60
Fall from height	13	26
Assault/injury with blunt objects	7	14

Table 3: Clinical presentation

Presentation	Number	%
Abdominal pain	43	86
Abdominal distension	27	54
Hematuria	2	4
Abdominal guarding and rigidity	39	78
Shock	16	32

Table 4: Organ involved in blunt trauma abdomen

Organs involved	Number	%
Liver	14	28
Spleen	8	16
Small intestine	7	14
Retroperitoneum	6	12
Kidney	5	10
Large intestine	3	6
Mesentery	3	6
Diaphragm	2	4
Bladder	1	2
Pancreas	1	2

Table 5: Treatment opted

Organ	Total cases	Surgery	Conservative
Liver	14	1	13
Spleen	8	5	3
Small intestine	7	0	7
Retroperitoneum	6	6	0
Kidney	5	0	5
Large intestine	3	3	0
Mesentery	3	3	0
Diaphragm	2	2	0
Bladder	1	0	1
Pancreas	1	0	1

Table 6: Causes of mortality

Mortality	Number	%
Shock	1	2
Septicemia	1	2
Renal failure	1	2
Cardio/respiratory failure	3	6

DISCUSSION

According to the findings of our research, the majority of patients (70%) were male, and just 15 were female. The ratio of males to females was 2.33 to 1, and the majority of instances occurred among people in their 30s and 40s (52%), followed by those in their 40s and 50s (22%). The average age was 38.25 years. The similarities between our research and that of Curie and Watne are striking.⁸ It demonstrated that the greatest number of cases occurred in the third decade (35%), with ages ranging from 15 to 72 years and a mean of 39 years. Allen and Curry came to similar conclusions in their research, which found that there were 28% of instances among those aged 20 to 29.⁹ As compared to previous studies, such as the one by Tripathi et al., our research found that the male to female ratio was 2.33:1.¹⁰ said that the ratio was 4.4:1, and the reason for this was due to the demographic composition of the state of Gujarat.

RTAs were responsible for sixty percent of all blunt injuries to the abdomen, which is consistent to the majority of prior studies. In addition, Mohapatra et al.¹¹ found that road traffic accidents were the cause of 62% of instances of blunt abdominal injuries. Another investigation carried out by Curie and Watne. According to another study⁸ 58.6% of blunt abdominal injuries was caused by road traffic accidents. While accidents involving motor vehicles and other types of RTAs are the most prevalent causes of abdominal trauma, this condition may affect people of any age.⁶ While seat belts may lessen the severity of injuries to the head and chest, they increase the risk of damage to internal organs including the pancreas and intestines. The second most prevalent cause was blunt abdominal injuries caused by falling from a height (26% of cases). Additional reasons included being struck by blunt objects or being assaulted, totaling seven (14%), which is similar to the results of the majority of previous investigations conducted by Mohapatra et al. and by Curie and Watne.^{8,11} Another risk for youngsters is getting their hands caught in bicycle handlebars when they are playing or riding bikes.¹² Spleen and liver trauma may be caused by traumatic events such as falls from great heights or sports injuries.

The combination of organs that are damaged is dependent not only on the location and force of the hit, but also on the position of the sufferer at the time of the injury.¹³ The reason why abdominal injuries are considered to be life-threatening is because the organs that are located in the retroperitoneal region have the potential to bleed excessively, which may sometimes result in hypovolemic shock before the patient is admitted to the emergency room. Because of its size and position, the liver is more susceptible to damage, and around 5% of individuals who have had abdominal trauma manifest with liver injury.¹⁴ Because of its large blood storage capacity and abundant blood supply, the liver poses a greater threat of severe shock. Injuries to the liver, such as

lacerations, contusions, and hematomas, are rather frequent; in certain cases, they may even lead to exsanguinations, which need immediate surgical intervention.¹⁵ The author of the current research showed that 32 percent of patients who presented to the emergency room with a case of blunt trauma to the abdomen also had shock as a clinical presentation. The author of the research discovered that the liver was the most often wounded organ, occurring in 14(28%) of the cases, while the spleen was the second most commonly injured organ, occurring in 8(16%) of the cases. Injuries to the upper abdomen and lower rib cage may cause damage to the liver, spleen, and pancreas, which can result in death. These injuries can occur in a variety of circumstances, and they claim victims every day.¹⁶ According to the findings of a research conducted by Rutledge and colleagues, the spleen is wounded more often than the liver.^{17,18} In our research, 14% of patients had injuries to their small intestine, and 12% of patients experienced injuries to their retro peritoneum.

As compared to a study conducted by Allen and Curry⁶ that found 35.3% of cases, our research found a much lower incidence of injuries to the small intestine. A, B, and C are the first steps taken in the assessment of any patient who has suffered trauma (airway, breathing, and circulation).¹⁹ If the patient is thermodynamically stable, diagnostic procedures like computed tomography (CT) scans may be conducted to evaluate abdominal and pelvic injuries. If the patient is not thermodynamically stable, however, these procedures cannot be performed. In individuals who are unstable, a USG or an extended FAST may be done.²⁰ Patients who are hypovolemic need either fluid resuscitation or a blood transfusion after it is determined that the main survey (A, B, and C) has been completed successfully. In the event that the patient's clinical indications go worse, an emergency laparotomy will be performed. Davis et al. revealed that 24.7% of patients had splenic injuries, and out of those instances, 10.7% were operated on and 14% were handled conservatively. Out of a total of 50 cases, 60% were treated with conservative care.²¹ In this particular research, there was evidence of liver damage in 28 percent of the patients. In contrast to the findings of this research by Davis et al., which revealed 16.47% of liver injuries, of which 14% required laparotomy, and suturing was performed in all of the cases, 16.47% of liver injuries were not treated surgically.²¹ In another investigation, Curie and Watne. found that 20.6% of people had damage to their liver.⁸ The procedures of splenectomy, primary closure of perforation and resection, and anastomosis were among of the most frequent operations that were done on patients. According to Siddique et al.²² patients who suffered blunt trauma to the abdomen needed procedures that were similar to those performed on them, and 41 (41%) of these patients were handled surgically. The results of our research are similar to those found in a study conducted by

Davis et al., which found that 24.7% of patients had splenic injuries, of which 10.7% required surgery and 14% were treated with conservative care.⁵ In our research, out of a total of 50 cases, only 40 percent were treated surgically while the remaining 60 percent were managed conservatively. Our findings are comparable to those found by Mohapatra et al.¹¹ who found that 39% of their patients underwent laparotomies. According to the findings of a study conducted by Rutledge and colleagues²² the incidence of non-operative management in blunt abdominal trauma patients who sustained both hepatic and splenic injuries was 48 percent. The severity of the patient's injury and their level of hemodynamic stability will determine whether or not conservative management is appropriate. Angiography-assisted embolization can be used to control bleeding, and patients who undergo this procedure have a favourable outlook.

It is possible for the patient's prognosis to deteriorate if the abdominal injuries are either delayed in receiving treatment or misdiagnosed. The complications that can arise from this condition include septic shock, delayed splenic rupture, cardiorespiratory failure, shock, and even death. According to the findings of this research, cardiorespiratory failure was the leading cause of mortality overall. 2% of the deaths were caused by sepsis, another 2% were caused by shock, and the other 2% were caused by renal failure. These numbers are identical to those found in a research by Jolly et al.²³ which indicated that wound infection occurred in 14% of the cases. In another piece of research, Davis and colleagues found that wound infection was a problem in 15% of the patients studied.⁵ These findings are close to those found in another research conducted by Jolly et al.²³ which revealed a mortality rate of 10% in their investigation, with septicemic shock being the leading cause of death. In yet another trial, Davis et al.⁵ found that the mortality rate was 15%, with septicemia being the leading cause of death.

CONCLUSION

According to the findings of this study paper, blunt abdominal trauma is a significant source of morbidity and death in young patients, with road traffic accidents being the most prevalent contributing factor. When a patient is brought into the emergency department, that patient should get prompt treatment, and an examination of that patient should be performed as quickly and thoroughly as possible. The earlier a patient is diagnosed, the lower their risk of death, and the better their chances of having a positive result and responding well to therapy they will have.

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