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Original Research Article

Hollow Viscus Injuries in Abdominal Trauma: A Prospective Study

Deepak Jadhav Maloth[1], V Shyam[2], Bushigampala Anil Kumar[3], Kyasa Shiva Kumar[4*]

[1,2,3,4]Assistant Professor, Department of General Surgery, Government Medical College, Siddipet, Telangana State

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Corresponding author: Dr. Kyasa Shiva Kumar
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Abstract:

Introduction: Abdominal organ injuries are the third most common injuries encountered after head and chest injuries. Hollow viscus injuries are not less common and are equally or more life threatening than solid visceral injuries accounting to more blood loss and contaminating bowel injuries.

Aim and Objectives: To study hollow viscus injury in the cases of abdominal trauma patients.

Materials and Method: This study was a prospective observational study includes 68 patients admitted in the casualty ward, of Chalmeda Anand Rao institute of medical sciences, Karimnagar, with abdominal trauma both blunt and penetrating injuries following road traffic accidents, assault by various objects, interpersonal violence and accidental falls during the period of one year after following inclusion and exclusion criteria and after approved from institutional ethical committee.

Results: In the study out of 68 patients, patients with age group between 12 to 70 years, majority of the patients were from the age group of 16 to 45 years. most frequent cause of blunt abdominal injuries was automobile accidents (61.8%), abdominal pain was the most prevalent symptom in the current study (61%). Jejunum, and Ileum was most commonly involved followed by gall bladder, urinary bladder and colon. wound infection is the most common complication seen in 10 patients (14%). Mortality is this study was 7.35%.

Conclusion: Blunt or penetrating abdominal trauma causes hollow viscus injuries in the stomach, small intestine, colon, rectum, gall bladder, and urine bladder. Trauma can produce anything from a little bruise to a life-threatening loss of blood.

Keywords: Hollow viscus injuries, Abdominal pain, Abdominal organ injuries, blunt and penetrating injuries.

Introduction

Abdomen is a commonly injured body region and most of the time requires the hands of a surgeon for definitive management. In patients sustained with abdominal trauma, penetrating injuries are proportionately more than blunt mechanisms. Whatever the type of injury these injuries require evaluation and management in the faster way possible. The issues to be addressed include bleeding and visceral perforation with associated sepsis. Abdominal organ injuries are the third most common injuries encountered after head and chest injuries. Blunt as well as penetrating injuries are not rare in hospital emergency departments. In trauma the most commonly affected organs are solid viscera and many analytical studies have been done on these. But, hollow viscus injuries are not less common and are equally or more life threatening than solid visceral injuries accounting to more blood loss and contaminating bowel injuries.

Most of injuries other than abdominal injuries reveal itself earlier but for blunt abdominal injury, which can be silent initially but causing fetal outcome later as time progresses. [1,2] Physical examination findings are notoriously unreliable. One reason is that mechanisms of injury often result in other associated injuries that may divert the physician's attention from potentially life-threatening intra-abdominal pathology.

The morbidity and mortality will eventually rise with any delay in diagnosis. Because abdominal hollow visceral injuries are so common these days, a general surgeon should be able to clinically suspect and treat trauma, especially those associated to them. Deaths due to abdominal injury can be prevented if diagnosed and managed early. Rapid resuscitation is necessary to save the unstable but salvageable patient with abdominal trauma.[2]

In this present study we are going to study hollow viscus injury in the cases of abdominal trauma patients.

Materials and Method:

This study was a prospective observational study includes 68 patients admitted in the casualty ward, of Chalmeda Anand Rao institute of medical sciences, Karimnagar, with abdominal trauma both blunt and penetrating injuries following road traffic accidents, assault by various objects, interpersonal violence and accidental falls during the period of one year after following inclusion and exclusion criteria and after approved from institutional ethical committee.

Inclusion Criteria

- Patients above the age of 12 years.
- Abdominal pain either blunt or penetrating and the clinical or radiological study.
- The intraoperative findings show hollow viscus injuries

Exclusion Criteria

- Patients less than age of 12 years.
- Patients with traumatic abdominal discomfort but did not have radiological or intraoperative signs of hollow viscus injuries were excluded from the study.

Method

Detailed and accurate history including age and sex of the patient, the mode of injury whether blunt or penetrating, symptoms with which the patient presented, the time elapsed since injury till admission were documented. Baseline investigations including Hemoglobin, Platelet count, Blood urea, Blood sugar, Serum electrolytes and Blood grouping were done for all patients. Cause of injury, presentation, site of injury, associated intra-abdominal and extra-abdominal injuries, delay in surgical intervention and its impact, type of surgical procedure performed, complications, need for ionotropic and ventilatory support, total hospital stay, and outcome in terms of mortality and morbidity.

Intraoperatively findings were noted including the organ injured and the type of injury; whether a contusion, mesenteric tear, perforation single or multiple. The way in which each case was operated was also taken into account. Most of the cases had primary closure of the perforation. Other management options were resection and anastomosis, omental patch closure.

Post-operatively patients were managed with nasogastric aspiration, ivfluids, and antibiotics. Daily patients were monitored and assessed for recovery and complications which were treated appropriately. Patients were discharged after full recovery and were followed up depending on the type of surgery performed.

Statistical Anlsysis :

Collected data were entered in Microsoft excel 2016 for further statistical analysis. Categorical data were expressed in terms of frequency and proportion while quantitative data were expressed in terms of mean and standard deviation.

Results and Observation:

In the following study total 68 patients were admitted with the abdominal trauma both blunt and penetrating injuries following road traffic accidents, assault by various objects, interpersonal violence and accidental falls, and following parameters included in the study were age distribution, sex distribution, mode of injury blunt or penetrating, organs injured in both types, radiological findings, treatment or intervention modalities, shown below.

Table 1: Distribution of demographic profile of study population

Parameters	Frequency	Percentage
Age (Years)		
< 15 Years	1	1.5
16 - 30 Years	37	54.4
31 - 45 Years	18	26.5
46 - 60 Years	7	10.3
> 60 Years	5	7.4
Gender		
Male	55	80.9
Female	13	19.1
Mode of Injury		
Blunt Injury	42	61.8
Penetrating injury	26	38.2

Table 2: Distribution of demographic profile of study population

Parameters	Frequency	Percentage
Type of Blunt Trauma		
RTA	26	61.9
Assault [knife, sharp objects]	7	16.7
Fall (Any Kind)	9	21.4
Organ Injured in Blunt Injury		
Jejunum	19	45.2
Ileum	15	35.7
Gall bladder	5	11.9
Urinary bladder	2	4.8
Colon	1	2.4
Organ Injured in Penetrating injury		
Ileum	11	42.3
Jejunum	7	26.9
Stomach	6	23.1
Colon [transverse]	2	7.7

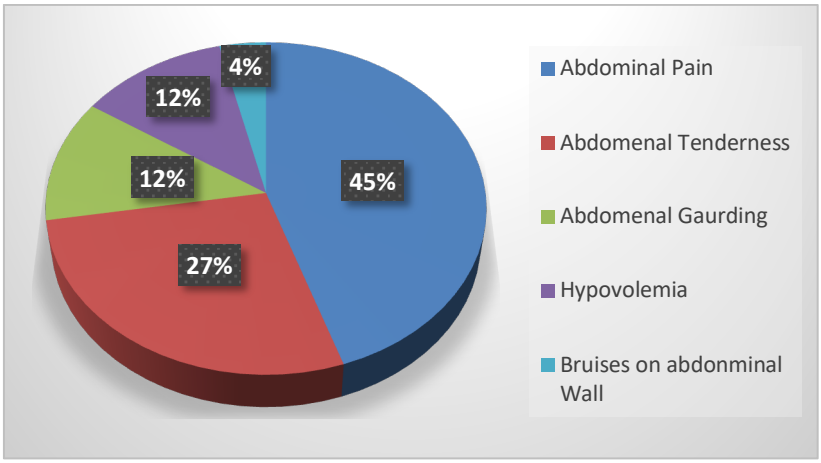

Figure 1: Distribution of symptoms among study population

Table 3: Radiological findings based on X-Ray findings

X ray abdomen erect	Frequency	Percentage
Air under diaphragm	42	61.8
Dilated bowel loops	4	5.9
Ground glass appearance	5	7.4
No abnormalities detected	11	16.2
Not taken	5	7.4

Table 4: Distribution of Mode of Management among study population

Mode of Management	Frequency	Percentage
Primary closure of perforation	30	44.1
Omental patch closure of perforation	10	14.7
Resection and anastomosis	14	20.6
Repair of serosal tear	6	8.8
Open cholecystectomy	5	7.4
Urinary bladder repair	3	4.4

Table 5: Distribution of Complications and outcome among study population

Complication	Frequency	Percentage
Complication		
Wound infection	10	14.7
Respiratory complications	7	10.3
Wound dehiscence	5	7.4
Outcome		
Mortality	5	7.35

Discussion

Hollow viscus injuries refer to injuries involving the organs of the gastrointestinal tract that have a lumen, such as the stomach, small intestine, large intestine, and the hollow portion of the biliary and urinary systems. Abdominal trauma can result in injuries to these hollow organs, and prompt recognition and intervention are crucial for patients outcomes. Abdominal trauma leading to hollow viscus injuries can occur due to various mechanisms, including blunt or penetrating trauma. Motor vehicle accidents, falls, assaults, and other traumatic incidents can cause significant force to the abdomen, potentially leading to injuries.

The management of hollow viscus injuries depends on the severity of the injury and associated complications. Surgical intervention is often required to repair perforations or remove damaged portions of the organ. Non-operative management may be considered for certain stable injuries.

In this prospective observational study we have included total 68 patients, among which majority of patients were male compared to female, which is comparable with study by Khadilkar, which also showed abdominal trauma was more common in males.[3]. In the present study we have patients with age group between 12 to 70 years, majority of the patients were from the age group of 16 to 45 years, only one patient was of younger age, and only 5 patients had age more than 60 years. Young individuals are more vulnerable to blunt and penetrating damage. This age group is the most prolific. This study can be compared to studies [1-3].

In the present study most frequent cause of blunt abdominal injuries was automobile accidents (61.8%). According to other studies, RTA was to blame for 62% to 70% of cases of blunt traumatic abdominal injuries[1]. Abdominal pain was the most prevalent symptom in the current study (61%). The results are close to those of studies by R.B. Dhaded and Dr. Vidhuta, which found that abdominal pain affected 85% and 96% of patients, respectively[4,5].

In the present study plain x-ray abdomen was done in all the patients. In which 61.8% were showing gas under diaphragm indicating frank pneumoperitoneum, and around 16.2% were showing no significant radiological abnormality. Another study by Mohapatra reported accuracy of x-ray erect abdomen to be 100% in detecting Hollow viscous injuries.[6] Davis reported that in their series, abdominal x ray was abnormal in 21% of cases; pneumoperitoneum was detected in 6% of cases and dilated bowel loops in 6% of cases.[2]

In this study Jejunum, and Ileum was most commonly involved followed by gall bladder, urinary bladder and colon. This result is compared to a study done by Allen and Curry which showed small bowel was involved in 35.3% of cases. [7] R. S. Raikwar reported Small intestine (ileal >jejunal) injury 45 cases i.e., 18% was most common hollow viscous injury in abdominal trauma patient. [8]

Primary closure of perforations is most commonly performed procedure (44.1%) This can be comparable with study by Khanna in which closure of bowel perforation was done in 13 patients (64%), colostomy in 5 patients, Results are also comparable to study by Sreenidhi G. who reported closure of bowel perforation was done in 54% patients.[9]

In the present study wound infection is the most common complication seen in 10 patients (14%) followed by respiratory complications 7 (10.3%) followed by wound dehiscence. Davis reported wound infection as a complication in 15% of the cases.[2] Reina khadilkar showed respiratory complication as the most common complication.[3] Similar results was shown by Sreenidhi G[9]. A total of 5 patients died in the present study. Mortality is this study was 7.35%. Similar results by Vidutha where mortality was 13%.[4] Decreased mortality is explained by better health care facilities and availability of broad spectrum antibiotics in present scenario. Present study observed most common cause of death was septicaemia followed by sudden cardiac arrest.

Conclusion

From above observation and after discussion with other studies we can conclude that blunt or penetrating abdominal trauma causes hollow viscus injuries in the stomach, small intestine, colon, rectum, gall bladder, and urine bladder. Blunt-force wounds are rarer than solid viscera wounds. Trauma can produce anything from a little bruise to a life-threatening loss of blood.

People belonging to young age group i.e. 16 - 45 were most commonly affected. Road traffic accident forms the most common mode of injury. Abdominal pain is the most common symptom and tenderness is the most common presenting sign. The most common injured viscera in the present study is small bowel and they were managed by simple suturing and closure of perforation and resection and anastomosis. Postoperative complications like wound infection, wound dehiscence, respiratory complications, mortality was among 7% of the patients due to septicaemia followed by sudden cardiac arrest.

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