ORIGINAL RESEARCH PAPER
Volume - 12 | Issue - 04 | April - 2023 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

CLINICAL STUDY OF BLUNT INJURY OF ABDOMEN AND ITS MANAGEMENT

Medical Science

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ABSTRACT

Introduction: Blunt abdominal trauma is common following major traumatic injury but may not be recognised quickly enough and is therefore a cause of preventable death in trauma patients. Emergency department nurses have a major role to play in reducing the incidence of unrecognised abdominal trauma by enhancing their knowledge and skills. They can do this by attending trauma-related courses, taking on more expanded roles, carrying out full and comprehensive physical assessments, and ensuring that members of the multidisciplinary team use the wide range of diagnostic adjuncts available to them. This article reviews the anatomy and physiology of the abdominal cavity, explains abdominal trauma, gives an overview of advanced abdominal assessment techniques and diagnostic adjuncts, and reviews some management strategies for uncontrolled haemorrhage that have been adopted in the UK. **Material and methods:** It is a descriptive cross-sectional study done over a period of one year in a tertiary care centre. **Results:** A total of 117 cases of blunt trauma abdomen were observed from March 2021 to September 2022. Out of 117 total cases 88 were males(76%) and 29(24%) were females. The most common symptom was pain abdomen and the most common sign was guarding/rigidity in patients with underlying pathology. A total of 15 patients died in the present study. **Conclusion:** We can conclude that Blunt trauma abdomen is a major cause of morbidity and mortality especially in young population and has various modes of presentation. The duration of symptoms is a major factor in reducing the mortality and hence improving access to healthcare should be a focus to reduce the trauma burden. BLUNT TRAUMA ABDOMEN can cause injuries to various organs and is mostly associated with other associated injuries and hence the diagnosis and management requires a set-up of multidisciplinary team.

KEYWORDS

INTRODUCTION:

In developing countries where modernisation and industrialisation are still going on, trauma emerges as a major cause of preventable death. In fact, at the present, trauma is the sixth leading cause of morbidity and mortality worldwide [(1)].The abdomen is the most frequently injured region after head injury and long bone fractures, and 25% of all abdominal trauma requires abdominal exploration [(2,3).] In cases of pre-existing underlying pathology, even trivial trauma to the abdomen can lead to significant haemorrhage and mortality if remains undiagnosed. Traditionally, abdominal trauma is classified either as blunt or penetrating [(4)]. Penetrating injuries include stab wounds and gunshot wounds while blunt abdominal injuries include motor vehicle crashes, fall from height, and physical assault [(5).] Blunt trauma abdomen is usually missed during the initial primary survey unless repeatedly looked for. In due course of time, this delay in diagnosis and inadequate management can prove fatal. It is imperative that we must supplement clinical examination with radiological imaging such as focused assessment with sonography in trauma (FAST) to diagnose free fluid in the peritoneal or pericardial cavity and contrast-enhanced computed tomography (CECT) torso to detect visceral abdominal and chest injuries. Blunt trauma to the abdomen can cause injuries to both solid and enteric viscera. Solid visceral injuries involve injuries to the spleen, liver, kidney, and present with signs of shock, whereas enteric injuries present with peritonitis and sepsis [(6-9).]

Blunt or penetrating trauma may lacerate or rupture intra-abdominal structures. Blunt injury may alternatively cause only a hematoma in a solid organ or the wall of a hollow viscus.

Lacerations bleed immediately. Haemorrhage due to low-grade solid organ injury, minor vascular laceration, or hollow viscus laceration is often low- volume, with minimal physiologic consequences. More serious injuries may cause massive haemorrhage with shock, acidosis, and coagulopathy; intervention is required. Internal haemorrhage may be intraperitoneal or retroperitoneal.

Laceration or rupture of a hollow viscus allows gastric, intestinal, or bladder contents to enter the peritoneal cavity, causing peritonitis.[11]

Abdominal injuries have been reported as the leading cause of preventable deaths in trauma victims. Thus, the objective evaluation of the abdomen by imaging methods becomes necessary in such patients.

Blunt abdominal trauma (BAT) may result in injuries to both solid and enteric viscera. These two groups present in broadly different manners[16-21] Usually, solid visceral injuries involve the spleen and liver, and present with signs and symptoms of internal haemorrhage. Enteric injuries, however, are more indolent in their presentation, and manifest with peritonitis and sepsis. [16,17,18,19]

The enteric structures at risk for injury following BAT include the small bowel and the duodenum. The management of blunt small bowel injuries (SBIs) is made challenging by the fact that they are very often occult in nature and difficult to detect. This results in both delayed diagnosis and delayed management, which in turn translates into increased morbidity. Blunt duodenal trauma (BDT) is another uncommon but serious blunt enteric injury. BDT is notoriously difficult to diagnose clinically as the duodenum is a retroperitoneal structure and clinical signs do not become manifest early[18] For this reason, similar to SBI, BDT is also associated with delayed diagnosis and management, and therefore increased morbidity.[19] Establishing the diagnosis relies on a policy of aggressive imaging based on mechanism of injury and clinical findings. Once diagnosed, the surgical management of BDT is also controversial.

Aims & Objectives:

Objectives:

1. To assess the symptoms and signs in predicting solid organ injury.
2. To calculate the incidence of blunt trauma abdomen in Jharkhand.
3. To evaluate the impact of blunt abdominal trauma on solid viscera like liver, spleen and hollow viscera like stomach, small intestine and large intestine, mesentery and retroperitoneal structures of the abdomen.
4. To evaluate the aetiology and various modes of presentation.
5. To evaluate various available investigations for the detection of intra-abdominal injuries.
6. To evaluate various modalities of treatment available for solid organs, hollow viscus with an aim to reduce the mortality and morbidity.

MATERIALS & METHOD

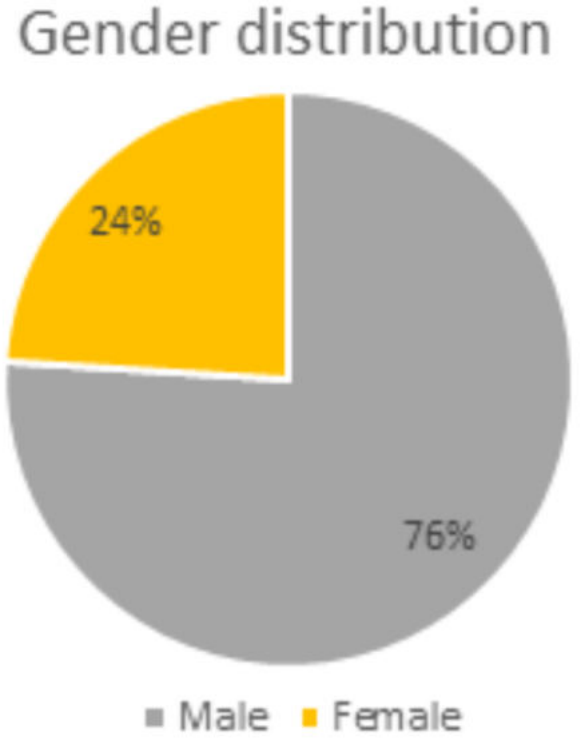
1. STUDY SITE: Emergency ,OPD and indoor patients in Department of General Surgery,Rajendra Institute of Medical Sciences (RIMS), Ranchi.
2. Study Type: Cross sectional study

3. **Study Duration:** March 2021-September 2022
4. **Sample size:** Calculated as $4pq/d^2$ (p= prevalence, q=1-p; d=absolute precision) Taking prevalance as 8% and confidence interval as 95% Sample size= 117
5. **Study Population:** Patients presenting with BLUNT INJURY ABDOMEN in Central emergency as well as indoor patients at RIMS hospital, Ranchi.
6. **Statistical Analysis:** Data were expressed as percentages, mean and range whenever applicable.

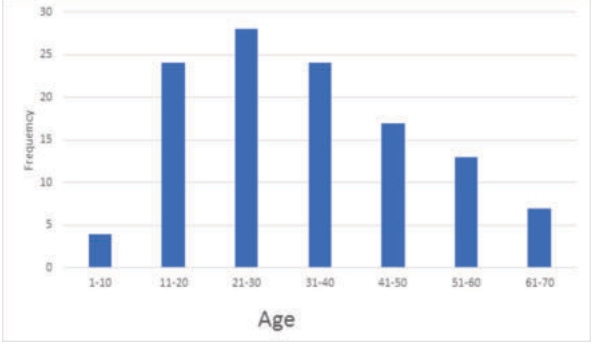
Inclusion Criteria:
1. Patients with history of recent assault by a blunt and heavy object over the abdomen.
2. Road traffic accidents.
3. Patients with a history of fall from a height.
4. Patient on whom there is a clinical suspicion of trauma to abdomen.
5. Patient with history of hematuria, distension of abdomen, without any specific etiology(suspecting trauma).
6. Injuries occurring during natural calamities like earthquakes landslides etc.

Exclusion Criteria
Patients with penetrating injuries by sharp objects and firearm injuries.

RESULTS:
A total of 117 cases of blunt trauma abdomen were observed from March 2021 to September 2022.



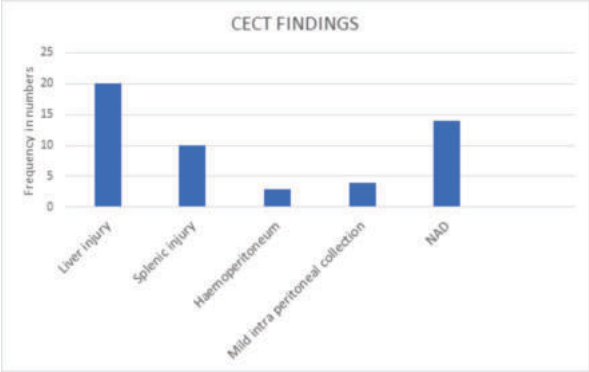
Out of 117 total cases 88 were males(76%) and 29(24%) were females.



Age	Frequency
1-10	4
11-20	24
21-30	28
31-40	24
41-50	17
51-60	13
61-70	7

SYMPTOMS AND SIGNS	FREQUENCY
Pain abdomen	104
Abdominal distension	16
Not passing flatus	12
Abdominal guarding	50
Rigidity	18
Rebound tenderness	8
Absent bowel sounds	63

SYMPTOMS AND SIGNS
The most common symptom was pain abdomen and the most common sign was guarding/rigidity in patients with underlying pathology.



Procedure	No. of patients
Primary repair	26
Resection anastomoses	11
Modified Graham Repair	2
Simple mesentery repair	12
Splenectomy	4
Stoma creation	25
Diaphragm repair	2

The following table shows the various operative procedures carried out among the patients who underwent exploratory laparotomy. Liver injuries were usually graded as I and III. All 20 patients with liver injury were managed conservatively. All 4 patients with splenic injury underwent splenectomy. Bowel perforations were treated with 2 layered closure, with 11 patients requiring resection and anastomosis. Omental and mesenteric injuries were treated by simple suturing and ligating the bleeding points. Bladder injuries were repaired by 2 layered closured. In the present series of 116 cases, two cases of duodenal perforation were found which was repaired using modified grahams omental patch technique. We could not find any case of disruption of the biliary tract and pancreatic injury in this series.

DISCUSSION
In our study we have observed an increase in the frequency of blunt trauma abdomen, probably related to the anarchic development of automobile traffic and armed attacks. The young adult was the target population with an average age around 30 years old. This frequency peak corresponds to the stage of life where medico-legal acts through

delinquency or violence are frequent in our country. Two retrospective studies of wounds in the abdomen found a mean age of 27.3–36 years [22]. These results were respectively observed in Africa and France. As for blunt trauma, an average age of 27 years was reported in underprivileged areas [23]. In the same context, a Malagasy study published in 2008 reported an average age of 29 years among 316 injured by traffic accident[24]. The cases reported concerned both men and women with a male predominance. This is a classic situation constantly observed in many publications. Aetiologies vary from country to country depending on economic, cultural and socio-political contexts. Most often, they are represented by CRAs and AVPs. This study only confirms them. Other aetiologies are rare: accident at work, attempted suicide. In the United States, the aetiology is more frequently violent, firearm or stabbing (60%) [25]. In Europe and outside war zones, abdominal trauma occurs in more than 60% of cases during accidents on public roads [25]. In India, the majority of severe abdominal trauma occurs during road accidents. A recent WHO report describes road injuries as a serious epidemic, because they are responsible worldwide for 1.2 million deaths per year: in fact, while mortality from RTA tends to decrease in Europe and in the United States. It is only increasing in less wealthy countries due to the anarchic development of automobile traffic (90% of deaths by RTA in the world cur among injured people living in low- or middle-income countries) [26].

In this study, the time to treatment was, in the majority of cases, included in the first 10 hours (33%). This is not far from the results reported in other low-resource countries [22-24]. However, the average delay was quite long (13h) since it was not uncommon to find ourselves faced with cases seen late. The reasons are multiple: distance between the place of the accident and the hospital, lack of medicalized transport, misdeed of traditional medicine. For prehospital deaths, the time elapsed between the accident and the hospital was 1 to 4 hours. This more or less late delay reflects the seriousness of these injuries which make the entourages rush to the hospital by means of transport, most often, makeshift. Because the emergency services at the scene of the accident were almost non-existent, ineffective and late. In terms of urgency, the mortality caused by abdominal trauma depends on the quality and precocity of prehospital care. A longer delay can lead to death in polytraumatized patients or victims of uncontrolled haemorrhagic lesions in this phase. A shorter delay causes the same fate because of the haemorrhagic and hypoxic effect of the extremely serious lesions. Death can occur just after the trauma, during transport or exceptionally before the operation. In a precarious situation, the technical platform is often disadvantaged. There is a mismatch between the needs and the means available in personnel, paraclinical examinations and therapeutic possibilities [27]. Management poses difficult diagnostic problems because the clinical examination is often non-contributory [28]; however, the indication for surgery in this situation is often based on the results of this examination, the imaging assessment being often incomplete. In the face of blunt trauma, the assessment of the hemodynamic state and the search for abdominal defence are the key element in the therapeutic decision. In our series, the predominance of peritonitis is explained by the delayed diagnosis of ileocecal wounds and the abundance of hemoperitoneum secondary to hepatosplenic lesions.

Given the precariousness of our technical platform, many patients could not benefit from appropriate radiological examinations. However, abdominal ultrasound, X-rays of the chest and pelvis are common practice in the management of these injuries. They can be performed within 30 minutes of the injured person arriving at the hospital and lead to treatment which is appropriate in 98% of cases [29]. Standard radiological examinations were rarely requested for economic, financial and contextual reasons. In the literature, X-rays of PSA, of the thorax and images centred on the cupolas are of very little contribution, except in the case of massive hemoperitoneum or pneumoperitoneum, and should no longer be part of the morphological examinations of patients who are victims of an abdominal wound [30]. Alternatively, emergency ultrasound, pleural, pericardial and peritoneal (E3P) ultrasound, is very widely practiced. It is very sensitive for the detection of liquid or even gaseous effusions, and can be implemented from the prehospital phase [31]. The absence of first aid at the scene of the accident, the lack of medical transport and the inadequacy of the care at the level of the reception structures do not make it possible to control the haemorrhage early or to prevent the aggravation of the extra injuries. -abdominal associated.

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