

## Original Research Article

# Pattern of illnesses presenting as acute abdomen: surgical study in 118 patients

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### ABSTRACT

**Background:** Acute abdomen is an important clinical entity and represents a symptom complex; of which, pain in the abdomen is a predominant feature. It is the result of some underlying condition and is a very common reason for patients reporting to emergency department. Pattern of illnesses presenting as 'acute abdomen' can vary from mild to life threatening in severity and management can similarly vary from just symptomatic relief to emergency operative intervention. It poses a significant challenge for the clinician since he is required to untangle the issue in a limited time frame and formulate a management plan. The aim of the study was finding the pattern of underlying conditions which had resulted in patients presenting with acute abdominal pain.

**Methods:** A prospective observational study was carried out on 118 patients who reported with 'acute abdomen', from August 2015 to February 2017.

**Results:** In this study, pattern of illnesses reflected that benign biliary disease was the commonest condition in the study population. This was followed by urolithiasis. An important observation was that 'non-specific abdominal pain' (NSAP) was the reason for acute abdomen in about 14% patients. Many other conditions like acute appendicitis, hollow viscus perforation, intestinal obstruction and pancreatitis presented with similar symptom complex in which abdominal pain was the main feature.

**Conclusions:** At the end of the study, we had a better knowledge of the conditions presenting as acute abdomen in the source population and the same can be utilized for further research in the field of this important clinical entity.

**Keywords:** Acute abdomen, Pain abdomen, Non-specific abdominal pain

### INTRODUCTION

Acute abdomen is defined as 'An abnormal condition characterised by sudden onset of severe pain in the abdomen. It requires immediate evaluation, diagnosis and may require surgical intervention'.<sup>1</sup>

It is a term used to describe a symptom complex; of which, pain in the abdomen is a predominant feature. There may be associated symptoms like vomiting, anorexia, constipation, abdominal distension and fever. It has sudden onset or onset over a short period of time, can persist for several hours to days and is associated with a

wide variety of clinical features specific to underlying disease. Such disease may be surgical, medical or gynaecological condition. Psychogenic pain may also present in the same manner. The clinical course may develop over a variable time period and may not have fully evolved by the time of presentation.

Significance of acute abdomen lies in the fact that it is one of the common condition encountered in emergency department and accounts for 4-5% of emergency department visits.<sup>2-4</sup> Healthcare system has to bear significant economic burden on account of this single clinical entity.

Acute abdomen occupies an important area of medical practice where surgeon reaches a 'working diagnosis' on clinical assessment alone without the aid of investigations.

Even today, acute abdomen remains an enigma. It poses a significant diagnostic and therapeutic challenge to the clinician. This is despite availability of modern imaging studies to help the diagnosis and better drugs and skilled anaesthetists to assist with therapy.<sup>5</sup>

Assessment of such patients and decision making for their management is crucial if major morbidity and mortality is to be prevented. Acute abdomen is a time sensitive disease i.e. there is an imperative of time in this clinical condition because of its surgical nature and necessity of making important decision regarding operative intervention within limited time-frame. Wise clinician tries to identify a clinical pattern, makes a working diagnosis and decides his action plan. Towards this aim it is important for treating doctor to possess knowledge about anatomy and pathophysiology of abdominal pain.

Other important aspect of this condition is the presence of certain factors, like atypical presentation and non-abdominal sources of abdominal pain, which confuse the clinician. Not every patient presents with the classical symptoms of the conditions included in the broad term 'acute abdomen'. In addition, both benign and life-threatening illnesses presenting as acute abdomen may have similar features. Though condition falls in surgical domain, there are many non-surgical causes such as basal pneumonia, myocardial infarction, sickle cell crises and metabolic diseases like porphyria and diabetic ketoacidosis; which should be considered while evaluating the patient. All these conditions can produce abdominal pain which mimics a surgical abdomen.

Root pain from Herpes Zoster may occur in abdominal region and can cause diagnostic confusion since it precedes other dominant feature of the condition i.e. vesicular rash.

Likewise, inflammatory conditions of the bowel e.g. typhoid fever and amoebic dysentery, may produce local peritonism similar to acute abdomen and diagnostic dilemma may arise.

Some patients may have referred pain and reflex guarding from supradiaphragmatic, scrotal or retroperitoneal pathology.

Similarly, many gynaecological and obstetric conditions like twisted ovarian cyst, salpingitis, endometriosis and ectopic pregnancy may present with features suggestive of acute abdomen.

Apart from relieving symptoms, the emergency surgeon's primary role is to optimise patient's general condition, reach a diagnosis and make an urgent therapeutic decision regarding definitive management in a time-bound manner.

Significant aspect of abdominal pain treatment is the need for appropriate diagnostic tests.<sup>6</sup> This is an essential requirement and cannot be ignored.

Indicated management may vary from reassurance to emergency surgery.<sup>7,8</sup> In many patients, symptoms may be due to benign condition and such cases may need no more than reassurance, symptomatic treatment and inpatient observation. A proportion of patients will be diagnosed with acute abdomen as a result of serious intra-abdominal pathology, which necessitates emergency operative intervention.<sup>9</sup> There may be some patients who being managed conservatively initially, eventually end up in operative intervention if the condition fails to settle.

The objective of study was to find the pattern of illnesses presenting as acute abdomen.

## **METHODS**

### ***Study protocol***

A study was conducted at a tertiary hospital in Northern India, from August 2015 to February 2017. It was designed as a prospective study.

Since study methodology did not require any type of intervention, ethical approval was not required.

The source population was, all patients who were treated in the hospital during the abovementioned period. One hundred and eighteen patients were enrolled for the purpose of this study. All the patients fulfilling inclusion criteria during study period were included and this became the sample size. The study has not applied any sampling technique as it was not logical here, since we have included all the patients which were fulfilling our eligibility criteria.

In all the patients, clinical condition was optimised first before embarking upon data collection related to this study. Patients hemodynamic parameters were stabilised and distressing symptom of pain was relieved on priority basis.

While study consisted of collection of data concerning patient profile, his symptoms, signs, diagnosis and management; definitive management was carried out concurrently.

### ***Inclusion criteria***

All patients in the age range 18-70 years, with abdominal pain as the presenting symptom. Patients who were suffering from protracted abdominal illness but presented with acute exacerbation; were included in the study.

### ***Exclusion criteria***

Those not willing to be part of this study. Those who were unwilling to get admitted. Patients aged less than 18 years;

aetiology of acute abdomen in this age group is different from adult group. Those above 70 years; as such patients may not give lucid history. Those with history of abdominal trauma. Female patients with gynaecological causes of acute abdomen. Pregnant patients presenting with acute abdomen. Patients with terminal oncological conditions presenting as acute abdomen. Patients in which medical conditions manifested with acute abdominal pain.

All the patients conforming to above criteria were admitted in the hospital and their consent, to be part of the study, was obtained.

Admission in hospital helped by giving an opportunity for close observation and re-evaluation of the patient. This was based on the fact that during the period of observation the disease might become more evident and be easily diagnosed. Those with non-specific abdominal pain might recover in the meantime.

Data concerning; age, symptoms, duration of illness, past surgery and visit to other health institutions was obtained.

Thorough physical examination was carried out for all acute abdominal emergencies, to arrive at a diagnosis.

Investigations varied according to individual patient's condition, and consisted of full blood count, urine analysis; estimation of urea, creatinine, amylase, lipase, liver function tests, electrolytes, blood sugar, X-rays of chest (erect), abdomen (erect and supine) and ultrasonography. Other investigations like CT scan abdomen, MRCP; were performed where indicated. A provisional diagnosis was made and treatment plan finalised based on that. USG in females mandatorily included assessment of pelvis.

Patients were managed conservatively or by operative intervention, based on working diagnosis and clues obtained from investigational workup. Diagnosis was further corroborated at the time of surgery, in patients who were managed operatively. Investigators arrived at final diagnosis and the pattern of illnesses; only after the definitive management.

#### Statistical tool

The data has been presented as number and percentage according to different criteria of distribution i.e. by age, gender, symptoms, signs, mode of treatment, and pattern of illnesses.

## RESULTS

Patients in the age group of 18-30 years formed the single largest group i.e. 34.75%. Other age group commonly affected was between 30-40 years i.e. 24.58%.

Gender wise distribution in the study population reflected that males were more commonly afflicted with an illness presenting as acute abdomen i.e. 55% vs 45%.

**Table 1: Age Wise distribution of patients.**

Age group (in years)	Number	Percentage
18-30	41	34.75
31-40	29	24.58
41-50	22	18.64
51-60	15	12.71
61-70	11	9.32
<b>Total</b>	<b>118</b>	<b>100</b>

**Table 2: Gender Wise distribution of patients.**

Age group (in years)	Male	Female	Total
18-30	24	17	41
31-40	16	13	29
41-50	13	9	22
51-60	7	8	15
61-70	5	6	11
<b>Total</b>	<b>65</b>	<b>53</b>	<b>118</b>
<b>Percentage</b>	<b>55.1</b>	<b>44.9</b>	<b>100</b>

In the study, abdominal pain was the presenting symptom in all (100%) the patients. Vomiting was present in 86 (72.9%) patients. Few more associated symptoms i.e. anorexia, fever, nausea and abdominal distension; were present. Eight (6.8%) patients complained of constipation.

**Table 3: Distribution of patients according to symptoms.**

Symptoms	Number	Percentage (%)
<b>Pain abdomen</b>	118	100
<b>Anorexia</b>	40	33.9
<b>Vomiting/nausea</b>	86	72.9
<b>Fever</b>	18	15.3
<b>Distension</b>	12	10.2
<b>Constipation</b>	8	6.8

Forty (33.9%) patients had tenderness on abdominal examination and guarding/rigidity was present in 25 patients (21.2%). All patients except one; were found to be hemodynamically stable on arrival. Three patients had lump in right iliac fossa. Abdominal distension was present in 12 patients (10.2%). Thirteen (11%) patients had altered bowel sounds, either exaggerated or absent.

**Table 4: Distribution of patients according to signs.**

Signs	Number	Percentage (%)
<b>Unstable vital signs</b>	1	0.8
<b>Tenderness</b>	40	33.9
<b>Guarding/rigidity</b>	25	21.2
<b>Absent/exaggerated bowel sounds</b>	13	11
<b>Distension</b>	12	10.2
<b>Lump</b>	3	2.5

**Table 5: Mode of treatment.**

Management	Number of patients (%)
Conservative	95 (80.5)
Exploratory laparotomy+ ancillary procedure (ileostomy, bowel resection appendicectomy)	8 (6.8)
Appendicectomy	9 (7.6)
Cholecystectomy	1 (0.8)
Drainage of abscess	2 (1.7)
Salpingectomy	1 (0.8)
Conservative management + referral to other centre	2 (1.7)
Second laparotomy (+tube duodenostomy and feeding jejunostomy)	1 (0.8)
Post-operative abscess drainage	1 (0.8)

**Table 6: Pattern of illnesses.**

Diagnosis	Number	Percentage (%)
Cholecystitis/ cholelithiasis	38	32.2
Urolithiasis	29	24.6
Appendicitis/ appendicular lump	13	11
Pancreatitis	6	5.1
Hollow viscus perforation	3	2.5
Intestinal obstruction	3	2.5
Mesenteric ischemia	1	0.8
Tubal gestation	1	0.8
Gastritis	3	2.5
Colitis	3	2.5
Liver abscess	1	0.8
NSAP	17	14.4
Total	118	100

Ninety-five patients (80.5%) were managed conservatively. Eight (6.8%) patients underwent exploratory laparotomy. Appendicectomy was carried out in 9(7.6%) cases. One (0.8%) patient was subjected to emergency cholecystectomy. Salpingectomy was done in 1(0.8%) patient. Second laparotomy was carried out in 1 patient because of postoperative complication.

Thirty-eight (32.2%) patients were diagnosed to be suffering from biliary disease. Urolithiasis was found to be the reason for acute abdomen in 29 (24.6%) cases. Appendicular pathology was detected in 13 (11%) patients. Six (5.1%) patients presented with features of pancreatitis. Intestinal obstruction was the diagnosis in 3 (2.5%) patients and same number of patients had evidence of hollow viscus perforation. Mesenteric ischemia was

found to be the reason for illness in 1 (0.8%) patient. NSAP was the final diagnosis in 17(14.4%) patients.

## DISCUSSION

Wide range of intra and extra abdominal pathologies can present as acute abdomen. This single clinical entity is a reason for emergency hospital admissions worldwide, in a significant percentage of patients.<sup>10</sup>

It may be a result of infection, mechanical obstruction, malignancy and ischemia involving abdominal organs.<sup>11,12</sup>

Recently, acute abdomen due to tuberculosis is becoming a major cause of surgical emergency.<sup>13</sup>

Managing acute abdomen is a test of clinical acumen of the treating clinician. An accurate history of the onset of abdominal pain and associated events, besides meticulous clinical examination are all crucial in arriving at a diagnosis. Further help is taken of the laboratory and imaging studies.

Whenever the diagnosis is elusive, serial examination of the patient on inpatient basis is a wise strategy.

Acute abdomen often requires surgery unlike diseases of other systems and sometimes operative intervention is the only solution available to prevent significant morbidity and mortality.

Analysing pattern of acute abdomen has epidemiological and clinical benefits too. This can help in designing a more structured diagnostic approach for the clinicians. It helps healthcare providers to develop their own algorithms for management of acute abdomen. Further, based on this knowledge, awareness can be created in the community, so that patients present early and morbidity and mortality due to life-threatening conditions presenting as acute abdomen can be prevented.

In our study, patients in the age group of 18-30 years formed the single largest group i.e. 35%. Other age group commonly affected was between 30-40 years. These two groups jointly comprised 59% of the patients.

Gender wise distribution in the study population reflected that males are more commonly afflicted with an illness presenting as acute abdomen i.e. 55% vs 45%. One probable explanation for this difference could be that female patients with gynaecological and obstetric conditions presenting as acute abdomen were excluded from the study.

In a similar study done by Memon et al, highest incidence was found in patients between 21-30 years i.e. (27.81%) with more male predominance.<sup>14</sup> This clearly points that younger age group is more commonly afflicted with this clinical condition. Our study reflected similar pattern.

In the study, abdominal pain of recent onset was the presenting symptom in all (100%) the patients. Other common symptom was vomiting, and it was present in 86 (72.9%) patients. There were few more associated symptoms which varied from patient to patient depending upon the underlying condition. Those who had generalised peritonitis, intestinal obstruction or pancreatitis; complained of abdominal distension. Similarly, few patients reported fever and anorexia; in addition to abdominal pain. Eight (6.8%) patients complained of constipation. They were finally diagnosed to have intestinal obstruction or pancreatitis or hollow viscus perforation. Most of the patients presented within 24 hours of onset of symptoms. All the patients except one presented within 48 hours.

Pain is the predominant symptom of the acute abdomen and the knowledge of anatomy and pathophysiology in this respect is important for assessment of such patients.

Though many other associated symptoms were present, their value in establishing a firm diagnosis could not be established. Medical literature also suggests that associated symptoms often lack specificity and atypical presentations are common.<sup>15,16</sup>

In the studies done by Jegaraj et al and Berhane et al, the commonest symptom was abdominal pain (100%) followed by vomiting (80%).<sup>17,18</sup>

In our study, all patients except one, were found to be hemodynamically stable on arrival. Only patient who presented with shock, had onset of symptoms three days before reporting to hospital and his unstable hemodynamic condition was due to sepsis. He was diagnosed to have hollow viscus perforation. Three patients had lump in right iliac fossa. They were labelled as appendicular lump on clinical assessment and the same was confirmed by USG. Patients with peritonitis, either localised or generalised, had tenderness and guarding/rigidity. These included patients with cholecystitis, appendicitis, colitis, mesenteric ischemia or hollow viscus perforation. Abdominal distension was present in 12 patients (10.2%) and these included cases of pancreatitis, intestinal obstruction and hollow viscus perforation. Thirteen (11%) patients had altered bowel sounds, either exaggerated or absent owing to mechanical obstruction or ileus due to peritonitis/pancreatitis.

In a study done by Singh et al in 2014, it was found that in acute abdomen, abdominal tenderness and abdominal distension were the common signs and study done by Hagos et al concluded that abdominal tenderness is the commonest sign (96%) followed by abdominal guarding/rigidity (90%).<sup>19,20</sup>

Patients were managed conservatively or by operative intervention, based on working diagnosis and clues suggested by investigations. Diagnosis was further

corroborated at the time of surgery, in patients who were managed operatively.

Ninety-five patients (80.5%) were managed conservatively. Non-operative management varied between patients, depending upon their underlying condition but broadly included observation in hospital, intravenous fluids, nil orally, antimicrobials and pain relief. Response was found to be satisfactory. Eight patients (6.8%) underwent exploratory laparotomy. These included three patients with intestinal obstruction, four patients with generalised peritonitis and one patient with mesenteric ischemia. Those who presented with diffuse peritonitis included three cases of hollow viscus perforation and one patient with perforated appendix. Latter underwent appendectomy as part of exploration of abdomen. Of the patients with hollow viscus perforation, one patient had ileal perforation and, in this scenario, ileostomy was carried out as an additional procedure besides perforation closure. In other two patients, peptic perforation was found and its closure was done. All the cases of intestinal obstruction had dense adhesions, consequent upon past surgery, as the underlying aetiology. They did not respond to conservative management and abdominal exploration had to be carried out. Ten patients (8.4%) underwent appendectomy and it included one patient with peritonitis; he had this procedure done as part of exploratory laparotomy.

One elderly patient presented with severe abdominal pain disproportionate to the signs. He was managed symptomatically. Symptoms persisted and during the course of hospital stay, he developed features of peritonitis. He was taken up for surgery. Operatively, there was evidence of bowel ischemia in the form of gangrenous bowel. Affected bowel segment (about 20 cm of ileum) was resected and two ends were exteriorised. Bowel continuity was restored at a later date.

A young adult woman presented with pain right iliac fossa. There was no history of amenorrhea. She had stable hemodynamics. Tenderness was present at Mc Burney's point besides forniceal tenderness being there on the right side. Urine pregnancy test was negative. USG could not give any conclusive diagnosis. She was taken up for surgery based on the clinical diagnosis of acute appendicitis. Operatively, she was found to be having mild bleeding from right fallopian tube along with evidence of gestation there. Salpingectomy was carried out, specimen confirmed tubal pregnancy histopathologically.

A patient of acute cholecystitis did not respond to conservative management. He underwent emergency cholecystectomy and was found to have gangrenous changes in the gall bladder. Drainage of pus was carried out percutaneously in the sole patient with hepatic abscess and also in one patient who had subphrenic abscess as part of peritoneal sepsis following treatment for hollow viscus perforation. One patient with appendicular abscess underwent surgery and pus was drained extraperitoneally.

All the patients suffering from pancreatitis were found to have milder form of disease as confirmed by CT scan. They recovered completely.

Two patients who were referred to other centres were kept under follow up. One patient with infected and obstructed kidney underwent percutaneous nephrostomy at urology centre. A patient with choledocholithiasis had his CBD cleared endoscopically at a gastroenterology centre.

Observations regarding management could not be compared with other studies because of stark difference in the pattern of illnesses. Other studies have reported higher incidence of conditions mandating operative intervention.<sup>21,22</sup>

In our study, cholelithiasis/cholecystitis, was found to be the most common condition presenting as acute abdomen. 38 (32.2%) patients presented with symptoms suggestive of the same. It formed single largest group. Diagnosis was established with the help of ultrasonography. One patient from this group also had obstructive jaundice due to choledocholithiasis. These patients presented with either biliary colic or pain due to inflammation of gall bladder. Urolithiasis was found to be the next common condition presenting as acute abdomen and was detected in 29 (24.6%) patients. Four patients presented with features suggestive of peritonitis and three among these had radiological evidence of hollow viscus perforation. Among these patients with perforation peritonitis, two had perforation of peptic ulcer while one had such lesion in terminal ileum. Peptic perforation cases did not give history of pre-perforation dyspepsia or pain. Patient with ileal perforation did give history of irregular fever a week before his admission as acute abdomen and was managed on the pattern of typhoid disease besides operative management of perforation in its own right.

One case of acute appendicitis was detected during exploratory laparotomy as he presented with features of generalised peritonitis and preoperative work up remained inconclusive. He was found to have perforated appendix. Eleven patients presented with unequivocal features of acute appendicitis. Of these, three had lump at the time of presentation. One such patient with lump had sonographic evidence of phlegmon having progressed to appendicular abscess. A patient who presented as acute abdomen, had sonographic evidence of acute appendicitis even though he did not exhibit anterior abdominal signs like guarding. Operatively, appendix was found to be located in retrocaecal position.

Three patients (2.5%) presented with clinical picture suggestive of intestinal obstruction. Six (5%) patients had features of pancreatitis. Investigational work up revealed biliary pathology as the underlying condition in 4 of these and other 2 patients had pancreatitis following consumption of alcohol. Six (5%) patients were found to be suffering from either colitis or gastritis, as shown in Table 6.

Similar studies done earlier had concluded that the common causes of acute abdominal pain necessitating admission to a surgical ward include acute appendicitis and nonspecific abdominal pain.<sup>23,24</sup> Yeboah et al in their study concluded that, the common cause of non-traumatic acute abdomen was acute appendicitis (22.4%) followed by perforation peritonitis (16.2%). Similarly, Agboola et al, in their study reported acute appendicitis (30.3%) as the commonest cause of non-traumatic acute abdomen. This was followed by intestinal obstruction (27.9%).<sup>21,22</sup>

Despite its common occurrence; in some cases, underlying aetiology in acute abdomen remains elusive. Specific diagnosis is not possible in 30% cases, despite thorough work up.<sup>25</sup>

De Dombal et al, in their study, recorded a diagnosis of 'NSAP', when no cause for the abdominal pain was found.<sup>26</sup> In our study, in 17 (14.4%) patients, aetiology could not be established and their diagnosis was NSAP. It did not mean that there was no cause. It meant that we needed to improve our diagnostic skill. There was no case of obstructed hernia or Meckel's diverticulum related acute abdomen in our series, nor was there any case of acute abdomen due to testicular torsion and retroperitoneal pathology like psoas abscess.

From the abovementioned, it is evident that the causes of acute abdomen are numerous and their incidence varies in different populations. Some studies have attributed, these differences in their incidence, to dietary and socioeconomic factors.<sup>27</sup>

Pattern of illnesses presenting as acute abdomen, in our study differed from other works mentioned above and no particular reason could be found for such difference.

### **Limitation**

Study was carried out in a tertiary hospital. If it had been done in a general hospital, findings could have been different. Similarly, a bigger sample size would have made it easier to generalise the conclusions.

### **CONCLUSION**

At the end of the study, we had a better insight of the spectrum of the conditions presenting as acute abdomen in the source population. Since the study population comprised only 118 patients, no definitive inference could be drawn from this. There is a scope for further work in the same field for better understanding of this important clinical entity and this study can provide a framework for the same. In the study, a high proportion of patients belonged to young productive age group and the disease, therefore, constitutes a great economic burden. Knowing the pattern of illnesses presenting as acute abdomen can help planners of healthcare in framing prompt treatment guidelines for such patients, since misguided management

and delay in decision for surgery, not only increase the duration of hospitalization but the mortality rate too.

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