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Clinical study, diagnostic aids and management of acute abdomen

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Abstract

Background: Evaluation of the emergency department(ED) patient with acute abdomen is sometimes difficult. Various factors can obscure the presentation, delaying or preventing the correct diagnosis, with subsequent adverse patient outcomes. Clinicians must consider multiple diagnoses, especially those life-threatening conditions that require timely intervention to limit morbidity and mortality. The term acute abdomen is constantly applied to such cases that signify the urgent need for prompt diagnosis and active treatment.

Objective: This study is designed to examine the present state of diagnosis and management of acute abdomen and to develop evidence based guidelines for the diagnostic pathway and management of acute abdomen.

Result: Our study showed that acute cholecystitis was the most common cause (29%) in patients presenting with acute abdomen followed by perforation peritonitis (25%). Pain and vomiting (49%) was the most common complaint followed by distension (44%). Ultrasound is the most sensitive and most commonly used diagnostic aid in acute abdomen. Majority of patients(73%) required surgical intervention.

Conclusion: Abdominal pain is a common presenting complaint in the ED and clinicians must consider multiple diagnoses, especially in those cases that require immediate intervention in order to limit morbidity and mortality.

Keywords: acute abdomen, diagnosis

Introduction

Acute abdomen means the patient complains of acute attack of abdominal pain that denotes any sudden, spontaneous disorder whose chief manifestation is in the abdominal area and for which urgent operation may be necessary. Because there is frequently a progressive underlying intra-abdominal disorder, undue delay in diagnosis and treatment adversely

affects outcome. Abdominal pain is one of the most common complaints leading people to the Emergency Department(ED), accounting for up to 7–10% of all Emergency department visits¹.

The approach to a patient with an acute abdomen must be orderly and thorough. An acute abdomen must be

suspected even if the patient has only mild or atypical complaints. The history and physical examination should suggest the probable causes and guide the choice of initial diagnostic studies. Computed tomography leads to the highest sensitivity and specificity in patients with acute abdominal pain. Positive predictive value of ultrasound is comparable with CT and therefore preferred as the first imaging modality due to the downsides of computed tomography; negative or inconclusive ultrasound is followed by CT².

The differential diagnosis of acute abdomen in the adult population is rather broad, including appendicitis, peptic ulcer, urinary stones, inflammatory bowel disease, hepatobiliary diseases (e.g., biliary colic, cholecystitis, and pancreatitis), referred pain due to pneumonia as well as several other “mimics” of extra-abdominal origin³. In young women, gynaecologic disorders (e.g., ectopic pregnancy, endometriosis, and pelvic inflammatory disease) are additional conditions which should be considered in the differential diagnosis⁴.

Various acute abdominal lesions may give similar signs and secondly pain from different organs may be referred to the same spot on the body surface. These factors are of importance from the point of making correct diagnosis and management of the urgent conditions rests largely on a correct analysis and interpretations of the most important complaint, namely pain.

Materials and Methods

We studied 200 cases of acute abdomen admitted to Guru Nanak Dev Hospital Amritsar attached to Govt. Medical College, Amritsar, Punjab with diagnosis of acute abdomen.

The record of these patients was then analyzed with respect to age, sex, symptoms, signs, X-ray findings, ultrasound findings, CT findings, and management of the cases.

Observations

Acute cholecystitis was the commonest cause of acute abdomen in the present study (i.e. 29%) followed by perforation peritonitis (25%) and acute appendicitis (12%). Renal colic was present in 11% cases. Haemoperitoneum was present in 10% of cases while intestinal obstruction in 7% of cases, acute pancreatitis in 3% cases and acute gastritis in 3% cases.

The maximum number of patients were in the age group of 21 to 30 years. The oldest case was 70 years old and youngest was 14 years old. Out of 200 patients, 58% were males and 42% were females.

Table 1 shows that after pain, vomiting was the commonest symptom (49%) followed by distension which was present in 44% cases. Dyspepsia was present in 35% of cases. Change in bowel habits, commonly constipation found in 33% cases. Fever was present in 28% cases and jaundice in 3% cases.

Table no. 2 shows that shock, tachycardia and signs of dehydration were present in 50% of cases. Decreased urine output was present in 48% of cases, anaemia in 45% cases while jaundice and oedema were present in 8% and 4% of cases respectively. On inspection distension of abdomen was present in 40% of cases and visible peristalsis in 7% of cases. On palpation, guarding and rigidity was present in 72% of cases and abdominal tenderness in 68% of cases. Liver was palpable in only 4% of cases. On percussion, shifting dullness and fluid thrill were detected in 36% of cases each. On auscultation, bowel sounds were heard in 36% of cases.

32% cases in plain chest X-ray showed air under diaphragm. Radio opaque shadows of stones were present in 14% of cases and multiple air fluid levels were present in 10% of cases on plain X-ray abdomen. Ultrasound abdomen showed dilated gut loops in 46% of cases and peritoneal collection in 44% of cases. Stones in gall bladder were present in 29% of cases and 20% cases were of acute cholecystitis, showing increased gall bladder wall thickness. One case revealed presence of stone in CBD. 11% of cases, showed renal stones. Inflamed appendix was present in 10% of cases on ultrasonography. Pericholecystic collection was present in 14% of cases. Bulky pancreas was present in 2% of cases and solid organ injury in 1% cases detected ultrasonographically.

Out of total 200 cases 54 were treated conservatively (i.e. 8 cases of acute intestinal obstruction, 8 cases of acute cholecystitis, 2 cases of acute appendicitis, 6 cases of haemoperitoneum, 6 cases each of acute pancreatitis and acute gastritis, 18 cases were of renal colic.

146 cases required operative treatment i.e. 50 cases underwent cholecystectomy, 34 cases required resection anastomosis, 18 cases required appendicectomy, Perforation was sealed in 40 cases and pyelolithotomy was done in 4 cases.

Table 1. Clinical symptoms

	Intestinal obstruction	Acute cholecystitis	Perforation Peritonitis	Appendicitis	Haemo-peritoneum	Renal colic	Acute Pancreatitis	Acute gastritis	Total
Pain	14	58	50	24	20	22	6	6	200
Vomiting	14	20	34	8	10		6	6	98
Change in bowel habit	14	2	46	4	-	-	-	-	66
Fever	4	4	40	2	4	-	2	-	56
Distension	14		50	4	16	-	4	-	88
Jaundice	-	6	-	-	-	-		-	6
Dyspepsia	6	58	-	-	-	-	18	3	70

Table 2. Clinical signs

		Intestinal obstruction	Acute cholecystitis	Perforation peritonitis	Appendicitis	Haemo-peritoneum	Renal colic	Acute pancreatitis	Acuet gastritis	Total
GPE	Anaemia	14	6	46	2	20	-	2	-	90
	Jaundice	2	8	-	-	2	-	4	-	16
	Oedema	2	-	6	-	-	-	-	-	8
	Signs of dehydration	14	-	50	6	20	2	6	2	100
	Decreased urine output	14	-	50	-	20	6	6	-	96
	Tachycardia	14	5	50	-	20	-	6	-	100
	Shock	14	-	50	6	20	2	6	2	100
Inspection	Visible peristalsis	14	-	-	-	-	-	-	14	28
	Distension abdomen	14	-	40	-	20	-	6	-	80
Palpation	Abdominal tenderness	10	40	50	24	4	-	6	2	136
	Guarding and rigidity	14	30	50	24	20	-	6	-	144
	Abdominal mass	-	-	-	-	-	-	-	-	-
Percussion	Shifting dullness	2	-	50	-	20	-	-	-	72
	Fluid thrill	2	-	50	-	20	-	-	-	72

Discussion

In this study it has been observed that acute cholecystitis was commonest i.e. 29% and was followed by perforation peritonitis (25%), acute appendicitis in 12% cases and haemoperitoneum in 10% of cases. Causes of acute abdominal pain include both medical and surgical. In an observational study by Tariq *et al.* from Pakistan, the most common cause of acute abdomen was acute appendicitis followed by acute pancreatitis and duodenal ulcer⁵. A recent study by Lakshay Chanana showed that, ureteric colic (16.3%), UTI (12.5%), acute pancreatitis (11%) and acute appendicitis (10.6%) were the most common reasons for ED visits due to abdominal pain⁶.

Majority of patients were in age group of 21-30 years. This is due to the fact that common conditions like intestinal obstruction, acute appendicitis etc are common during this age. A study by Leung showed that specifically gastroenteritis, acute appendicitis, and abdominal trauma are common causes of the acute abdomen in children and young adults⁷.

A study conducted by Hendrickson showed biliary disease, intestinal obstruction, diverticulitis, and appendicitis are among the most common causes in middle-aged adults and the elderly⁸. Furthermore Kamin says, pelvic pathology accounts for approximately 12% of acute abdominal pain presentations and should therefore be considered when evaluating female patients⁹.

Parry conducted a study which says that typhoid can result in intestinal hemorrhage or perforation—two potentially fatal causes of an acute abdomen requiring surgical intervention⁸. In one series, typhoid fever complicated by ileal perforation was diagnosed in 16% of patients in a region of West Africa, making it the second most common cause of the acute abdomen¹⁰.

Signs of dehydration, shock and tachycardia were present in 50% cases. This is due to reduced fluid intake or excessive fluid loss i.e. haemorrhage or collection in the extracellular spaces.

Anaemia was present in 45% of cases, visible peristalsis present in 7% cases, abdominal distension in 40% cases. Abdominal guarding and rigidity was present in 72% of cases. Shifting dullness and fluid thrill was present in 36% cases and bowel sound was present in 23% of cases. In a study conducted by Samir Ray, out of 110 cases of acute abdomen, 42 were caused by acute appendicitis and hence it forms

the major reason among the causes of acute abdomen. Fever was present in 48% cases, abdominal pain in 91% of cases, vomiting in 87% and abdominal distention was seen in 90% cases. Diarrhea was seen in 10% cases. Constipation was seen in 41% cases and abdominal tenderness in 86%, guarding and rigidity was in 54% cases and bowel sounds were present in 30% cases. Free fluid was present in 63% cases and pneumoperitoneum was present in 41% cases¹¹.

X ray in our study showed positive finding in 56% of cases (air under diaphragm in 32% of cases, radio opaque shadow of stones in 14% cases, multiple air fluid levels in 10% cases). Gans showed that conventional radiography has a diagnostic accuracy of 47-56%. Conventional radiography correctly diagnosed the presence of a cause in 47% of patients¹².

On Ultrasonography, dilated gut loops were present in 46% of cases, peritoneal collection was present in 44% of cases. Gall stones were present in 58 cases (100%) sensitive. Acute appendicitis was diagnosed in 18 out of 24 cases showing sensitivity of 82%. Gans study showed that the diagnosis based on clinical assessment and ultrasound corresponds with the final diagnosis in 53-83% of patient. In 70% of patients, an urgent diagnosis was correctly identified based on clinical assessment and ultrasound¹².

The CT scan has sensitivity of 96% overall for diagnosing most causes of the acute abdomen, compared to a 30% sensitivity for plain films¹³. CT scanning has had a significant impact on the diagnosis of acute appendicitis as it has decreased the negative appendectomy rate from 24 to 3%¹⁴. Diagnostic laparoscopy may be of utility in the evaluation of acute abdominal pain, especially in situations in which the underlying etiology remains unclear despite a thorough clinical evaluation and radiologic imaging. The advantages of diagnostic laparoscopy include its ability to make a definitive diagnosis in 90-98% of cases and determine whether further intervention is necessary¹⁵.

Conclusion

Abdominal pain is a common presenting complaint in the ED and clinicians must consider multiple diagnoses, especially in those cases that require immediate intervention in order to limit morbidity and mortality. Acute cholecystitis, perforation peritonitis, acute appendicitis and haemoperitoneum are the main causes of acute abdomen with pain is the most common symptom followed by vomiting (49%) cases. X ray findings were positive in 56% cases. Ultrasound

is the most sensitive and most commonly used diagnostic aid in acute abdomen.

Patient outcome is good in acute abdomen if appropriate diagnosis and management is done early and accurately.

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