



## Surgery

## A COMPARATIVE ANALYSIS OF CLINICAL, RADIOLOGICAL AND OPERATIVE FINDINGS IN ACUTE ABDOMEN

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**ABSTRACT** **Aim-** To study the accuracy of clinical and radiological diagnosis in non-traumatic cases of acute abdomen. **Methodology:** A prospective observational study was conducted on 74 four patients who presented to Accident and Emergency department of Aditya Birla Memorial Hospital, Pune with non- traumatic acute abdomen and underwent emergency surgical intervention over a period from Jan 2017 to March 2018. Pre-operative clinical and radiological diagnosis based on clinical examinations and radiological investigations was compared with post-operative diagnosis based on operative findings. **Results:** Diagnostic accuracy of clinical diagnosis in comparison to post-operative diagnosis was 87.83% and radiological diagnosis in comparison to post-operative diagnosis was 95.94%. **Conclusion:** The study strongly suggested that with thorough history taking and proper clinical examination, clinical diagnosis was successfully achieved in 88% of patients. Radiological investigations help in confirming clinical suspicions and giving added information of underlying pathology with accuracy of 96%.

**KEYWORDS :** Acute abdomen, Clinical diagnosis, Radiological diagnosis, Operative diagnosis

## INTRODUCTION

'Acute abdomen' encompasses a range of trivial to life threatening surgical, medical and gynecological emergencies. These conditions often require hospital admission, investigation and treatment. Accurate diagnosis and management of patients with acute abdomen remains one of the most challenging tasks for surgeons. The wide range of causes and various spectrum of patient presentation present a formidable diagnostic and therapeutic challenge. Acute abdominal conditions encompass one of the few areas of medical practice where the surgeon often reaches a clinical diagnosis without resorting to radiologic investigations.<sup>1</sup>

Accurate recording of the relevant facts is vital and a clear understanding of the anatomy and pathophysiology of intra-abdominal disease is necessary for both diagnosis and treatment. The immediate feedback that an emergency operation provides, on the accuracy and the adequacy of the pre-operative assessment and preparation is another reason why the patient with an acute abdomen is an important part of surgical practice.<sup>2</sup>

## AIMS AND OBJECTIVES-

- To study the various clinical parameters which help in making a diagnosis and assess the accuracy of clinical diagnosis in comparison to post-operative diagnosis in non-traumatic cases of acute abdomen.
- To assess the accuracy of radiological diagnosis in comparison to post-operative diagnosis in non-traumatic cases of acute abdomen.

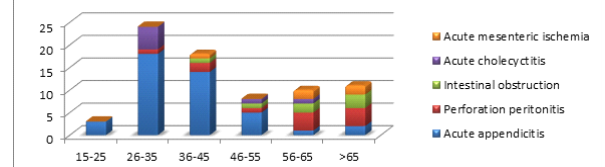
## MATERIALS AND METHODS

A prospective observational study of acute abdomen was carried out at Aditya Birla Memorial Hospital, Chinchwad, Pune. A total of 74 cases of acute abdomen patients were evaluated and operated over a period from Jan 2017 to March 2018 were included in the study group. Paediatric age group, traumatic cases, acute abdomen in pregnancy and gynecological causes of acute abdomen, urological cases, and conservatively managed cases were excluded from the study. Detailed

history was taken and relevant physical examination performed. All patients underwent hematological and biochemical investigations, appropriate radiological investigation (USG, AXR and CT-scan) were performed based on clinical suspicion. Pre-operative diagnosis based on clinical examinations and radiological investigations was compared with operative findings.

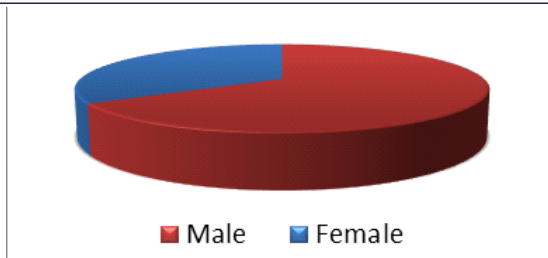
## RESULTS AND DISCUSSION

More than half of the patients in our study were in age group of 26-45 years with majority amongst them in age group of 26 - 35 years (n=24/74, 32.43%), followed by age group of 36 - 45 years (n=18, 24.32 %). Acute appendicitis is relatively rare in infants and becomes increasingly common in childhood and peaks in early adult life. After middle age, the risk of developing appendicitis is quite small<sup>3</sup>. In our study acute appendicitis was commonly seen in age group of 15 to 45 years (35 out of 43 patients). Acute cholecystitis was commonly seen in age group of 26-45 years (5 out of 7 patients) and perforation peritonitis, intestinal obstruction and acute mesenteric ischemia were predominantly seen in the elderly age group (17 out of 24 patients were > 55 years age). Similar results were observed in the study done by Batra *et al*<sup>4</sup> where most common age group of acute abdomen was 26 - 35 years while another study done by Sabhnani and Tomar<sup>5</sup> also reported most common age group for acute abdomen as 21 - 40 years.



**Figure no 1:- Bar diagram showing age wise distribution of patients in study group**

In our study out of 74 patients, 49 (66.22%) were males and 25 (33.78 %) were females. Similar findings were reported in other studies on acute abdomen done by Reddy *et al*<sup>6</sup> and Batra *et al*<sup>4</sup>.



**Figure No 2:- Pie diagram showing gender wise distribution of cases in study group**

A thorough and detailed history of symptoms is the cornerstone for an accurate diagnosis.<sup>7</sup> Abdominal pain is most important symptom of acute abdomen present in all patients of acute abdomen.<sup>3</sup> Location of pain helps to identify underlying site of pathology. In our study too abdominal pain was most common symptoms present in all patient followed by vomiting which was seen in 54 (72.97%) patients, anorexia in 49 patients (66.22 %), fever in 32 patients (43.24 %), constipation in 8 patients (10.81%), and diarrhoea in 5 (6.76%) patients. Pain generally precedes vomiting in surgical conditions, with exception of esophageal rupture from forceful emesis. Vomiting is usually present in small bowel obstruction. Nature of the vomiting may be diagnostically helpful. With small bowel obstruction, a progression from gastric contents to bilious to feculent emesis is anticipated as the duration of the illness increases<sup>8</sup>. Diarrhea is a frequent accompaniment of more benign abdominal conditions, its presence alone should never rule out serious disease. For example, diarrhea is common with mesenteric ischemia and is frequently reported in conditions such as appendicitis. While fever points towards an infectious cause; absence of fever does not exclude infection.<sup>9</sup> Results reported in literature about symptomatology in acute abdomen are similar to our study, In a study done by Reddy *et al*<sup>6</sup> and Arora *et al*<sup>5</sup>, vomiting was second most common symptom and anorexia was third most common symptom after abdominal pain.

Regarding clinical signs, tenderness was the most common clinical sign observed in almost all patients of acute abdomen (n=73, 98.65%). Rebound tenderness was observed in 32 patients (43.24 %) and

Guarding/rigidity was observed in 16 patients (21.62%). Distension was present in 14 patients (18.91%) and Tachycardia was present in 24 patients (32.43%), Abnormal bowel sounds were observed in 21 patients (28.38 %), Bowel sounds were exaggerated in 3 patients, all belonging to obstructive pathology while bowel sounds were sluggish to absent in 18 patients. Tachycardia should alert the clinician to a serious cause of the abdominal pain. However, the presence of normal pulse rate does not exclude a serious diagnosis<sup>7</sup>. Abdominal tenderness is the objective expression of pain from palpation. Location of abdominal tenderness helps to identify underlying site of pathology<sup>1</sup>. Guarding is an excellent indication of irritation of parietal peritonium. This may be due to inflammation, presence of blood or contents of hollow organs within the peritoneal cavity. This is a part of the protective mechanism. In auscultation, the 'silent abdomen' is a pathognomonic feature of diffuse peritonitis and 'noisy abdomen' is a feature of acute intestinal obstruction.<sup>10</sup>. Findings observed in study done by Arora *et al*<sup>5</sup>, the commonest clinical sign was tenderness present in 117 out of 125 patients followed by guarding in 78 out of 125 patients, tachycardia in 58 out of 125 patients, distension in 43 out of 125 patients, rigidity in 29 out of 125 patients and rebound tenderness in 22 out of 125 patients.

Commonest clinical diagnosis was acute appendicitis (n= 41, 55.40%) followed by perforation peritonitis (n=12, 16.22%), intestinal obstruction (n=7, 9.45%), acute cholecystitis (n=6, 8.11%), and acute mesenteric ischemia (n=2, 2.70%), enterocolitis (n=3, 3.86%), uretric calculi (n=2, 2.70%), and acute pancreatitis (n=1, 1.35%). After confirming diagnosis by radiological investigations, patients underwent surgery. Accuracy of clinical diagnosis was compared with final post-operative diagnosis. Accuracy of clinical diagnosis for detecting acute appendicitis in comparison to post-operative diagnosis was 95.35%, 83.33% for perforation peritonitis, 85.71 % for acute cholecystitis, 85.71 % for intestinal obstruction, 40 % for acute mesenteric ischemia respectively and overall clinical accuracy was 87.83 %. Results observed in study done by Batra *et al*<sup>8</sup>, in which clinical diagnostic accuracy in diagnosing acute appendicitis in comparison to postoperative diagnosis was 88.24%, 71.43% for diagnosing perforation peritonitis, 96% for diagnosing intestinal obstruction and overall were 76.19%. Study done by Reddy *et al*<sup>6</sup> shows clinical diagnostic accuracy in diagnosing acute appendicitis over postoperative was 93.10%, 100% for diagnosing perforation peritonitis, 100% for diagnosing intestinal obstruction.

**Table 1: Correlation between clinical and post-operative diagnosis**

Clinical diagnosis	Operative diagnosis					
	Acute appendicitis	Perforation peritonitis	Intestinal obstruction	Acute cholecystitis	Acute mesenteric ischemia	Total
Acute appendicitis	41	0	0	0	0	41
Perforation Peritonitis	0	11	0	0	1	12
Intestinal obstruction	0	0	6	0	1	7
Acute cholecystis	0	0	0	6	0	6
Acute mesenteric ischemia	0	0	0	0	2	2
Acute pancreatitis	0	0	0	1	0	1
Enterocolitis	0	1	1	0	1	3
Uretric calculi	2	0	0	0	0	2
<b>Total</b>	<b>43</b>	<b>12</b>	<b>7</b>	<b>7</b>	<b>5</b>	<b>74</b>

Clinical Diagnosis	Diagnostic accuracy as compared with post-operative diagnosis
Acute Appendicitis	95.35
Perforative Peritonitis	83.33
Intestinal Obstruction	85.71
Acute cholecystis	85.71
Acute mesenteric ischemia	40
<b>Overall</b>	<b>87.83</b>

Accuracy of radiological diagnosis was compared with final post-operative diagnosis. The Accuracy of radiological diagnosis for acute abdomen over post-operative diagnosis in detecting acute appendicitis was 97.67%, 91.67% for diagnosing perforation peritonitis, 100 % for diagnosing acute cholecystitis, 100 % for diagnosing intestinal obstruction, 80 % for acute mesenteric ischemia and overall radiological accuracy was 91.89 %. Results observed in study done by

Reddy *et al*<sup>6</sup> shows radiological diagnostic accuracy in diagnosing acute appendicitis over postoperative was 95%, 83.3% for diagnosing perforation peritonitis, 93.3% for diagnosing intestinal obstruction. In study, done by Batra *et al*<sup>8</sup>, radiological diagnostic accuracy in diagnosing acute appendicitis over postoperative was 94.12%, 92.86% for diagnosing perforation peritonitis, 92% for diagnosing intestinal obstruction and overall was 90.48%.

**Table 2: Correlation between radiological and postoperative diagnosis**

Radiological diagnosis	Operative diagnosis					
	Acute appendicitis	Perforation peritonitis	Intestinal obstruction	Acute cholecystitis	Acute mesenteric ischemia	Total
Acute appendicitis	42	0	0	0	0	42
Perforation Peritonitis	0	11	0	0	0	11

<b>Intestinal obstruction</b>	0	0	7	0	1	8
<b>Acute cholecystitis</b>	0	0	0	7	0	7
<b>Acute mesenteric ischemia</b>	0	0	0	0	4	4
<b>Ovarian cyst</b>	1	0	0	0	0	1
<b>Pelvic abscess</b>	0	1	0	0	0	1
<b>Total</b>	43	12	7	7	5	74

<b>Radiological Diagnosis</b>	<b>Diagnostic accuracy as compared with post-operative diagnosis</b>
<b>Acute Appendicitis</b>	97.67
<b>Intestinal Obstruction</b>	100
<b>Perforative Peritonitis</b>	91.67
<b>Acute cholecystitis</b>	100
<b>Acute mesenteric ischemia</b>	80
<b>Overall</b>	<b>95.94</b>

### CONCLUSION

The study has suggested that surgeons with thorough history taking and proper clinical examination, clinical diagnosis can successfully achieve in 88% of patients. Radiological investigations help in confirming clinical suspicion and giving added information of underlying pathology with accuracy of 96%

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