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Surgery Section

Clinical Presentations and Operative Management of Non Traumatic Acute Pain Abdomen- A Prospective Interventional Study from Jorhat, Assam, India

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ABSTRACT

Introduction: Non traumatic acute abdominal pain is a very common reason for patients' visit to the Emergency Department and remains a challenging task for general surgeons in terms of appropriate diagnosis as well as management in a timely manner.

Aim: To evaluate the clinical presentations, the operative management and the postoperative outcome of patients presented with non traumatic acute pain abdomen.

Materials and Methods: A hospital-based prospective interventional study was done in 250 patients presenting with non traumatic acute pain abdomen to the Emergency Department of General Surgery, Jorhat Medical College and Hospital, Jorhat, Assam, India, from June 2021 to May 2022. Demographic profile, detailed history physical examination, operative managements and the outcome were noted. The data was tabulated on Microsoft excel 2021 and analysed with relevant tables and graphs.

Results: Out of 250 patients with non traumatic acute pain abdomen who underwent operative intervention, most affected age group was 2nd-4th decade of life, comprising 165 (66%) patients. A total of 167 (66.80%) were males. Most common presenting symptom besides pain abdomen was nausea, seen in 172 (68.80%) cases. Most common clinical sign besides tenderness was abdominal muscle guarding, seen in 220 (88%) cases. Acute appendicitis was the most common aetiology with 129 (51.60%) patients and emergency open appendicectomy was the most common surgical procedure performed. Most common postoperative complication was surgical site infection, seen in 57 (22.80%) cases. Mortality rate was 3.60% (9 deaths).

Conclusion: As most acute pain abdomen invariably present with surgical emergency and varied aetiology, the complexity for imparting the most appropriate treatment is increased. Hence, surgeons in the emergency department need to be well-versed in assessing the patients right from taking of proper history, clinical correlation of symptoms to elicitation of signs, assisted with most readily available investigations, to arrive at a prompt diagnosis to provide appropriate surgical intervention at the earliest.

Keywords: Acute abdomen, Complications, Laparotomy

INTRODUCTION

The term "acute abdomen" refers to the clinical manifestation of symptoms and signs of abdominal pain and tenderness, which frequently necessitates emergency surgical treatment. To identify the need for surgical intervention and to begin the proper therapy in this complex clinical circumstance, a complete and quick work-up is necessary [1]. The term acute abdomen essentially implies a sudden onset, but the clinical course of abdominal symptoms can range from minutes to several hours to weeks. The term, acute abdomen, is often synonymously used for various conditions that require immediate operative interventions [2]. Many diseases, some of which do not require surgical treatment, produce abdominal pain, so the evaluation of patients with abdominal pain must be methodical and careful. Correct preoperative diagnosis of acute abdomen with limited resources before a laparotomy is essential in reducing morbidity and mortality in a developing country like ours [3].

There were accounts of 675 patients visiting the emergency department presenting with non traumatic acute pain in the abdomen over a period of one year in the study conducted by Poudel R et al., [4]. Similarly there were 326 such patients in another study by Kumar MS et al., in a period of one year who visited the emergency department [5]. All those patients were undertaken for immediate operative intervention as a life saving procedure. This shows the high frequency and severity of the disease condition, and where appropriate diagnosis and treatment could not be delayed. Therefore, as soon as the patient comes to the emergency room or a surgical outpatient department, it is very essential to quickly identify the cause for any immediate indication for surgical intervention. History and physical examination findings should be based on sufficient clinical experience, precise knowledge of the anatomy and physiology of the abdominal cavity, and a clear understanding of the pathological processes. Based on the results of clinical evaluation, laboratory investigations and radiological imaging, a correct diagnosis can be established.

This study was conducted to understand the spectrum of causes, clinical presentations, surgical management, and postoperative complications including mortality in patients with non traumatic acute pain abdomen.

MATERIALS AND METHODS

This hospital-based prospective interventional study was conducted in the Department of General Surgery at Jorhat Medical College and Hospital, Jorhat, Assam, India, from 1 June, 2021 to 31 May, 2022. Ethical clearance was obtained from the Institutional Ethics Committee of Jorhat Medical College, Jorhat, Assam, India. (No. SMEJ/JMCH/MEU/841/Pt-2/2011/3671(A), Jorhat dated the 8th of July, 2021).

Inclusion criteria: All patients aged 13 years and above with acute abdominal pain with no recent history of trauma, who underwent emergency operative intervention were included in this study.

Exclusion criteria: Traumatic causes of acute abdomen, medical causes of acute abdomen, obstetrics and gynaecological causes, urological causes, acute abdomen managed conservatively, patients aged below 13 years were excluded from this study.

Using consecutive sampling method, all 250 patients who underwent emergency operative intervention within the study period were included in the study.

Study Procedure

On presentation of the patients to the Emergency Department as well as surgery outdoor patient department, detailed history regarding the pain abdomen, vomiting, fever, abdominal distension, diarrhoea or constipation, if present, was obtained. Patients were also enquired about the history of medical treatment or abdominal surgery. History of other medical diseases like heart disease, cardiovascular accidents, diabetes, liver and kidney diseases, metastatic disease, and tubercular disease were also obtained. Menstrual and obstetric histories were also taken in female patients. Examination findings like temperature, pulse rate, blood pressure, respiratory rate, visible peristalsis, abdominal tenderness, guarding, rigidity, significant per rectal findings and groin swelling were recorded. Severity of the presentation was looked for, considering if there was presence of sepsis, shock, severe inflammatory response syndrome and/or presence of organ dysfunction.

The investigations conducted in all patients were: routine blood examination with platelet count, blood sugar, urea, serum creatinine, sodium, potassium, calcium, blood grouping, prothrombin time, International Normalised Ratio (INR), chest X-ray Postero-Anterior (PA) view, abdominal X-ray erect and supine, Ultrasonography (USG) of whole abdomen and Electrocardiography (ECG). Computed tomography of abdomen was done in selected cases only. The patients were taken to operating room, once the operative intervention such as Emergency (open appendicectomy/ cholecystectomy/choledocholithotomy/exploratory laparotomy and proceed) was decided upon. Postoperative complications were also noted.

STATISTICAL ANALYSIS

Data collected were statistically described and tabulated in terms of range, mean±standard deviation. The data was tabulated on Microsoft excel 2021 and analysed with relevant tables and graphs.

RESULTS

A total of 250 patients operated for acute pain abdomen were included in this study. The mean age of the study population was 35.45 (±15.55) years. The most affected age group was 13-40 years of age comprising 104 (41.6%) patients out of 250 total patients [Table/Fig-1].

The numbers of male and female patients were 167 (66.8%) and 83 (33.2%), respectively [Table/Fig-2]. The mean age of the study population was 35.45 (±15.55) years [Table/Fig-1] Acute appendicitis was the most common aetiology consisting of 129 (51.60%) patients. Male to female ratio was 1.18:1. Mean age was 28.78 years. Hollow viscus perforation and intestinal obstruction both were found to be the second most common aetiology. They consisted of 52 (20.80%) patients each. Male to female ratio was 9.4:1 in both the cases. Mean age for hollow viscus perforation was 36.88 years. In intestinal obstruction, the mean age was 48.30 years [Table/Fig-2].

Age range (years)	Number of patients (N) (%)	Male/Female (N)	Mean age (SD)
13-20	48 (19.20%)	29/19	35.45 (±15.55) years
21-30	73 (29.20%)	45/28	
31-40	44 (17.60%)	30/14	
41-50	33 (13.20%)	24/9	
51-60	34 (13.60%)	25/9	
61-70	10 (4%)	7/3	
71-80	8 (3.20%)	7/1	
Total	**250 (100%)**	**167/83**	

[Table/Fig-1]: Age distribution.

Disease condition	Aetiology	Number of cases	Male/ Female (N) (ratio)	Mean age (years)
Inflammatory causes of non traumatic acute abdomen (146, 58.4%)	Acute appendicitis	129	70/59 (1.18:1)	28.79
	Acute cholecystitis	17	3/14 (0.21:1)	40.88
Hollow viscus perforation (52, 20.8%)	Gastric ulcer perforation	11	47/5 (9.4:1)	36.88
	G.B perforation	2		
	Duodenal ulcer perforation	22		
	Jejunal perforation	3		
	Ileal perforation	10		
	Transverse colon perforation	1		
	Sealed duodenal perforation	1		
	Sealed gastric perforation	2		
Intestinal obstruction (52, 20.8%)	Inguinal hernia obstruction	19	47/5 (9.4:1)	48.30
	Rectal growth	7		
	Adhesion band	6		
	Intussusception	4		
	Sigmoid volvulus	4		
	Gastric outlet obstruction	4		
	Mesenteric vascular ischaemia	3		
	Abdominal cocoon	2		
	Ca caecum	1		
	Ca ileum	1		
	Ileus	1		
Total		250	167/83 (2.01:1)	

[Table/Fig-2]: Aetiology of non traumatic acute pain abdomen.
G.B.: Gall Bladder; Ca: Carcinoma

Nausea was the most common symptom presented in 172 (68.80%) cases [Table/Fig-3]. Abdominal guarding was the most common clinical sign found in 220 (88%) cases [Table/Fig-4]. Emergency

Aetiology (n)	Nausea (n)	Vomiting (n)	Fever (n)	Diarrhoea (n)	Constipation (n)	Abdominal distension (n)
Acute appendicitis (129)	105	86	107	23	33	13
Hollow viscus perforation (52)	27	29	43	9	42	51
Bowel obstruction (52)	25	29	3	1	50	52
Acute cholecystitis (17)	15	8	12	0	6	2
Total (250)	172	152	165	33	131	118
Percentage 100%	68.80%	60.80%	66%	13.20%	52.40%	47.20%

[Table/Fig-3]: Symptoms in relation to aetiology.

open appendicectomy is the most performed operation, done in 129 (51.60%) cases [Table/Fig-5]. Surgical site infection was the most common complication seen in the postoperative period comprising of 57 (22.80%) patients. Mortality was 3.6% with nine overall deaths [Table/Fig-6].

similarities of the findings of this study with previous studies [4,6-10]. Besides acute appendicitis other aetiologies encountered were hollow viscus perforation, intestinal obstruction and acute cholecystitis which were managed operatively in the emergency setting.

Aetiology (n)	Tachycardia (n)	Fever (n)	Dehydration (n)	Abdominal distension (n)	Abdominal guarding (n)	Abdominal rigidity (n)	Absent bowel sounds (n)
Acute appendicitis (129)	87	88	87	10	128	4	10
Hollow viscus perforation (52)	47	37	50	52	45	40	50
Bowel obstruction (52)	10	6	35	51	30	3	4
Acute cholecystitis (17)	8	10	14	2	17	0	0
Total (250)	152	141	186	115	220	47	64
Percentage (100%)	60.80%	56.40%	74.40%	46%	88%	18.80%	25.60%

[Table/Fig-4]: Signs in relation to aetiology.

Aetiology	Operative procedure	Number of cases
-Acute appendicitis	Emergency open appendicectomy/with peritoneal toileting	129 (51.6%)
-Acute appendicitis with perforation		
-Appendicular abscess		
-Acute cholecystitis	Emergency laparoscopic/open cholecystectomy/ with choledocholithotomy with T-tube drain placement/ choledochoduodenostomy/subtotal cholecystectomy with peritoneal toileting	17 (6.8%)
-Acute calculous cholecystitis with choledocholithiasis		
-Mucocoele gall bladder		
-Empyema gall bladder		
-Gall bladder perforation	Emergency exploratory laparotomy/with subtotal cholecystectomy/ with primary repair of perforation with a live omental patch/with gastro-jejunostomy/with feeding jejunostomy/with resection and anastomosis of ileum with loop ileostomy with peritoneal toileting	52 (20.8%)
-Gastric perforation/sealed perforation		
-Duodenal perforation/ sealed perforation		
-Jejunal perforation		
-Ileal perforation		
-Transverse colon perforation		
-Bowel obstruction due to adhesion band	Emergency exploratory laparotomy/with the release of the band/ with reduction of hernial content/herniorrhaphy/hernioplasty/ Partial gastrectomy/gastro jejunostomy/with resection of bowel in intussusception with end-to-end anastomosis of the healthy bowel ends/with resection of involved bowel with the growth with end-to-end anastomosis of healthy bowel with Transverse loop colostomy/ ileostomy/with manual decompression of bowel with insertion of a flatus tube/with resection and repair of ischaemic mesentery with resection of the gangrenous descending colon with descending colostomy. Diagnostic laparoscopy with emergency exploratory laparotomy with mobilisation of small bowel and opening of the abdominal cocoon with peritoneal toileting	52 (20.8%)
-Obstructed inguinal hernia		
-Gastric outlet obstruction		
-Bowel obstruction due to intussusception		
-Bowel obstruction due to rectal growth/carcinoma ileum/carcinoma caecum		
-Sigmoid volvulus		
-Bowel obstruction due to mesenteric vascular ischaemia		
-Bowel obstruction due to ileus		
-Abdominal cocoon		
	Total	**250 (100%)**

[Table/Fig-5]: The various operative procedures executed in patients of study according to aetiology (N=250 patients).

Aetiology	Number of operated cases (n)	Surgical site infection (n)	Lower respiratory tract infection (n)	Urinary tract infection (n)	Dyselectrolytemia (n)	Septicaemia (n)	Faecal fistula (n)	Burst abdomen (n)	Death (n)
Acute appendicitis	129	18	4	7	6	3	0	0	4
Bowel obstruction	52	12	7	8	8	4	0	0	3
Hollow viscus perforation	52	21	9	9	8	3	1	1	2
Acute cholecystitis	17	6	2	0	0	0	0	0	0
Total	250	57	22	24	22	10	1	1	9
Percentage (%)	100%	22.80%	8.80%	9.60%	8.80%	4%	0.40%	0.40%	3.60%

[Table/Fig-6]: Complications following operative managements.

DISCUSSION

In this study, only the operated patients for acute pain abdomen were selected. This study showed that acute appendicitis was the most common aetiology of non traumatic acute pain abdomen needing immediate surgical intervention. A 13-40 years of age were the mostly affected age group. Males were more affected than females. [Table/Fig-7] shows the

Clinical features very often included nausea, vomiting and abdominal muscle guarding [Table/Fig-8] as seen in other studies [7,8,11]. Surgical site infection was the most common postoperative complication. Other complications occurring in the immediate postoperative period were urinary tract infection, lower respiratory tract infection and dyselectrolytemia. There was a mortality of 3.6% showing a fairer outcome over studies conducted by few authors [Table/Fig-9] [7,9,11,12].

Author	Place of study	Age group	Male %	Female %	Most common aetiology
Poudel R et al., (2019) [4]	Universal College of Medical Sciences, Bhairahawa, Nepal.	20-30 years	54.54%	45.46%	Acute appendicitis (52%)
Wossen MT (2019) [6]	Ayder Referral Hospital, Mekelle University, Tigrai, Ethiopia.	8-48 years	75%	25%	Acute appendicitis (55%)
Gebrie T et al., (2019) [7]	Attat Hospital, Zone, Ethiopia.	14-48 years	62.60%	37.4%	Acute appendicitis (48%)
Jain R and Gupta V (2016) [8]	Sri Aurobindo Medical College and PG Institute, Indore, Madhya Pradesh, India.	21-30 years	71.43%	28.57%	Hollow viscus perforation (39.7%)
Gebre S (2016) [9]	Suhul General Hospital, Shire, Northwest Tigray, Ethiopia.	10-30 years	56.60%	43.40%	Acute appendicitis (54.2%)
Chanana L et al., (2015) [10]	Christian Medical College, Vellore, India.	15-40 years	56.80%	43.20%	Acute appendicitis
Present study	Jorhat Medical College and Hospital, Jorhat, Assam, India.	13-40 years	66.80%	33.20%	Acute appendicitis (51.60%)

[Table/Fig-7]: Most common age group, gender distribution and commonest aetiology [4,6-10].

Author	Place of study	Most common symptom	Most common sign
Gebrie T et al., (2019) [7]	Attat Hospital, Zone, Ethiopia.	Nausea/vomiting (80.10%)	Tachycardia 63.70%
Jain R and Gupta V (2016) [8]	Sri Aurobindo Medical College and PG Institute, Indore, Madhya Pradesh, India.	Vomiting (72.40%)	Abdominal guarding (61.20%)
Hagos M (2015) [11]	Mekelle Hospital, Ethiopia.	Vomiting (49.80%)	Abdominal guarding (90%)
Present study	Jorhat Medical College and Hospital, Jorhat, Assam, India.	Nausea/vomiting (68.80%)	Abdominal guarding (88%)

[Table/Fig-8]: Symptom and clinical signs [7,8,11].

Author	Place of study	Most common postoperative complication	Mortality percentage
Gebrie T et al., (2019) [7]	Attat Hospital, Zone, Ethiopia	Surgical site infection (5.4%	9.35%
Gebre S (2016) [9]	Suhul general hospital, Shire, northwest Tigray, Ethiopia	Surgical site infection (12.70%)	4.20%
Hagos M (2015) [11]	Mekelle Hospital, Ethiopia.	Surgical site infection (19.7%)	6.40%
Malviya A et al., (2017) [12]	Dr. Sampurnanand Medical College, Jodhpur, Rajasthan, India.	-	3.39%
Present study	Jorhat Medical College and Hospital, Jorhat, Assam, India.	Surgical site infection (22.80%)	3.60%

[Table/Fig-9]: Postoperative complications and mortality [7,9,11,12].

The doctor on duty must be well aware with the presentations as well as the common causes of acute abdominal pain as it is very commonly encountered feature in the emergency department. The treating surgeon must also be prompt at clinical assessment and diagnosis while simultaneously resuscitating the patient, to reduce the morbidity and mortality in such situation. To aid the clinical diagnosis, minimum required available diagnostic test should be ordered so that decision for operative intervention to save the patient's life can be made on time. Care should also be taken to minimise the financial burden of the patient while seeking such investigations.

Limitation(s)

There was a limitation in the adequate follow-up in the outdoor patient department, after discharge of the patients. This may be attributed to the difficulty to commute during the study period when lockdown was imposed due to the Coronavirus Disease-2019 (COVID-19) pandemic. This limited the knowledge of delayed postoperative complications which may have arisen.

CONCLUSION(S)

It is apparent from this study that non traumatic acute pain abdomen was a common presentation at the Emergency Department with a high morbidity and acute appendicitis as the leading cause for such pain abdomen. Regardless of the aetiologies, male patients and age group 2nd-4th decade of life were mostly affected. Although symptoms and signs like nausea, vomiting and abdominal muscle guarding were very common, they were not pathognomonic of a particular aetiology. Therefore, proper clinical assessment, adequate resuscitation, proper laboratory and radiological investigations, close monitoring of vitals and timely decision making for the required surgical intervention remains the mainstay of management of such patients.

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