

ORIGINAL ARTICLE

Spectrum and Outcome of Acute Abdomen in Surgery Department of a Mission Hospital

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ABSTRACT

Background: Acute abdomen usually refers to a sudden onset severe abdominal pain that requires urgent attention. It is a medical emergency in many cases and significant number requires immediate surgical intervention.

Objective: To evaluate the epidemiology, aetiological pattern and treatment of acute abdomen managed operatively in a mission hospital.

Methodology: This is a three-year retrospective study spanning from January 2014 to December 2016. All the patients that had surgical operation for a preliminary diagnosis of acute abdomen within the study period were recruited into the study. Patient's demographics including: age, sex, diagnosis, intra-operative findings, operative procedures, complications and outcome were recorded.

Results: A total of 177 surgeries were done for acute abdomen out of 1,908 surgical operations amounting to 9.28% of the total surgeries done during the study period. Patients' age ranged from 4-85 years with a mean of 33.98 ± 17.57 years; and a male to female ratio of 1.08:1. A total of 83(46.9%) of the patients had appendicitis related diagnosis, 16(9.0%) of the cases resulted from trauma, 25(14.1%) had intestinal obstruction from post-operative bands, 28(15.8%) had intestinal obstruction from colonic tumours and 17(9.6%) had perforated peptic ulcer disease. A total of 12 patients had complications following surgery giving a complication rate of 6.8%. Five patients died giving a mortality rate of 2.8%.

Conclusion: Acute appendicitis and its complications still remained the most common acute abdomen. Mortality rate from acute abdomen is low at 2.8%.

Key words: Abdominal Pain, Aetiological pattern, Morbidity, Mortality.

INTRODUCTION

Acute abdomen usually refers to a sudden onset severe abdominal pain that requires

urgent attention.¹ Also, acute abdomen is a term frequently used by some Physicians to describe the acute abdominal pain in a sub-

group of patients who are seriously ill and have abdominal tenderness and rigidity.² It is a medical emergency in many cases and significant a number requires immediate surgical intervention.³

A wide range of clinical conditions are grouped under this term. This includes inflammatory conditions like: acute appendicitis, cholecystitis, pancreatitis, diverticulitis; bowel perforations like perforated peptic ulcers, typhoid perforation; bowel obstructions including small and large bowel obstructions; mesenteric ischaemia; abdominal traumas; urologic conditions like pyelonephritis, ureteric calculi; some gynaecologic emergencies like ruptured ectopic pregnancies, twisted ovarian cysts and a host of medical conditions grouped under non-specific abdominal pain like complications of diabetes mellitus, sickle cell anaemia etc. The commonest presentation in all these conditions is abdominal pain.^{4,5}

The attending emergency Physician has a lot of work to do trying to unravel the possible cause of an acute abdomen. Clinical evaluation which involves careful history taking and physical examination is paramount. The site of an abdominal pain among other features could suggest the possible aetiology. The location of the pain corresponds to different anatomical structures.

For instance, back pain usually indicates a retroperitoneal source of abdominal pain. The bladder, distal colon, and pelvic organs refer pain to the supra-pubic region. The small bowel, appendix, and mid-gut structures often convey a peri-umbilical pain. Pain from the stomach, pancreas, liver, and gallbladder often will convey an epigastric pain.^{6,7} The location and timing of the pain, whether the pain is relieved by eating, and other

information obtained from a patient history are some of the information that an attending physician may use to diagnose and treat abdominal pain.

Before the wide spread use of modern imaging techniques, most of the patients diagnosed as having acute abdomen would undergo surgical exploration.^{2,8} However, with current imaging modalities such as ultrasound and CT-scan, a lot of the patients especially those categorized as 'Non-specific abdominal pain' do well on conservative managements.^{1,8} The aim of this study is to evaluate the epidemiology, aetiological pattern and treatment of acute abdomen managed operatively in the Surgery Department of a specialist mission hospital.

METHODOLOGY

This is a three-year retrospective study spanning from January, 2014 to December, 2016. The study was carried out at Iyenu mission hospital, Ogidi. The hospital is a multi-specialist missionary health facility located in Anambra State, South-East Nigeria.

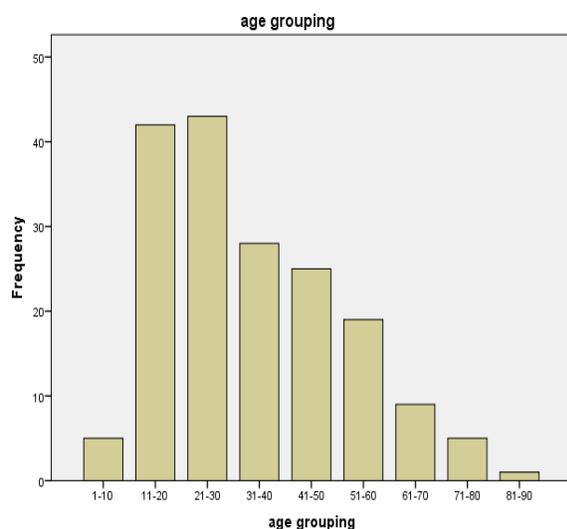
All the patients that had surgical operation for a preliminary diagnosis of acute abdomen within the study period were recruited into the study. Obstetrics and Gynaecological surgeries were excluded.

The patient's particulars were obtained from the theatre records and the case notes retrieved from the records department. Patient's demographics including: age, sex, diagnosis, intra-operative findings, operative procedures, complications and outcomes were extracted and analysed. Analysis was done with SPSS version 21.0 (IBM Corporation and other(s) 1989, 2012) and results presented in tables and charts.

RESULTS

A total of 1,908 surgical operations were done during the study period. Out of this number, a total of 177 surgeries (9.28% of the total surgeries) were done for a diagnosis of acute abdomen and forms the study population. A total of 717 abdominal surgeries were done during the period and acute abdomen constitute 24.69% of the abdominal surgeries. Patients' age ranged from 4-85 years with a mean of 33.98 ± 17.57 years. The peak age groups were 11-20 years and 21-30 years (Figure 1).

Figure 1. Bar chart showing age group distribution of patients



Out of the 177 patients with acute abdomen, 92(52%) were males and 85(48%) were females giving a male to female ratio of 1.08:1.

A total of 83(46.9%) of the patients had appendicitis related diagnosis: 57(32.2%) had acute appendicitis; 25(14.1%) had ruptured appendix and one patient had appendix abscess (Table 1). Sixteen (9.0%) of the cases resulted from trauma, 25(14.1%) had intestinal obstruction from post-operative bands, 28(15.8%) had intestinal obstruction from

colonic tumours and 17(9.6%) had perforated peptic ulcer disease (PPUD) (Table 1). Overall, intestinal obstruction both by post-operative bands and colonic tumours constitutes 53(29.9%) of all cases.

Table 1. Frequency table showing various intra-operative diagnoses

Diagnosis	Frequency	%
Trauma	16	9.0
Acute Pancreatitis	1	0.6
Acute Appendicitis	57	32.2
Ruptured Appendix	25	14.1
Appendix Abscess	1	.6
Intestinal obstruction from bands	25	14.1
Intestinal obstruction from Colonic tumour	28	15.8
Perforated peptic ulcer disease	17	9.6
Typhoid Perforation	3	1.7
Gastric outlet obstruction	4	2.3
Total	177	100.0

The peak age group for acute appendicitis is in the 11-20 years with 34[(34/57) 59.6%] patients. The peak for ruptured appendix is 21-30 years group with 12[(12/25) 48%] of cases (Table 2).

Out of a total of 16 patients with trauma, 15(93.8%) were males giving a male female ratio of 15:1. Out of 57 patients with acute appendicitis, 16(28.1%) were males and 41(71.9%) were females with male to female ratio of 1:2.3. Out of 25 patients with ruptured appendix, 16(64.0%) were males and 9(36.0%) were females giving a male to female ratio of 1.8:1 (Table 3). On the whole, out of a total of 83 patients with appendicitis 32 were males

while 51 were females giving an overall male to female ratio 1:1.6 (Table 3).

All the 177 patients had laparotomy with additional procedure(s) (Table 4). Out of the 83 patients with appendicitis, 81(97.6%) had appendectomy while the remaining two (2.4%) had bowel resection (right hemicolectomy).

A total of 12 patients had complications following surgery, giving a complication rate of 6.8%. Out of these 12 patients with post-operative complications; seven patients had surgical site infection (SSI), three had wound dehiscence and two patients had acute renal failure. The patients that had SSI did well on

antibiotic course and wound dressing. The patients with wound dehiscence had secondary wound closure after days of wound dressing and antibiotics. The three patients with acute renal failure recovered after four courses of haemodialysis. Mortality occurred in five patients giving a mortality rate of 2.8%. Out of the five mortality cases; two had perforated peptic ulcer disease, one had typhoid perforation, one had ruptured appendix and remaining one had intestinal obstruction. All the mortalities were probably due to late presentation as all presented more than five days from onset of abdominal pains. All the patients that died developed sepsis and multiple organ dysfunction before death.

Table 2. Diagnoses and age group cross tabulation

Diagnosis	Age groups									Total
	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	
Trauma	0	2	8	5	0	0	1	0	0	16
Acute pancreatitis	0	0	0	1	0	0	0	0	0	1
Acute appendicitis	1	34	15	3	4	0	0	0	0	57
Ruptured appendix	2	5	12	5	0	1	0	0	0	25
Appendix abscess	0	0	0	1	0	0	0	0	0	1
Intestinal obstruction from bands	2	0	2	5	7	7	1	1	0	25
Intestinal obstruction from tumours	0	1	2	2	6	7	6	3	1	28
Perforated peptic ulcer disease	0	0	2	4	7	3	0	1	0	17
Typhoid perforation	0	0	1	2	0	0	0	0	0	3
Gastric outlet obstruction	0	0	1	0	1	1	1	0	0	4
Total	5	42	43	28	25	19	9	5	1	177

Table. Sex and diagnoses cross tabulation

Diagnosis	sex of patient		Total
	female	male	
Trauma	1	15	16
Acute pancreatitis	0	1	1
Acute Appendicitis	41	16	57
Ruptured Appendix	9	16	25
Appendix Abscess	1	0	1
Intestinal obstruction from bands	12	13	25
Intestinal obstruction from colon tumour	15	13	28
Perforated peptic ulcer disease	2	15	17
Typhoid Perforation	3	0	3
Gastric outlet obstruction	1	3	4
Total	85	92	177

Table 4. Frequency table showing various treatment modalities.

Treatment	Frequency	%
Repair of bowel	25	14.1
Appendicectomy	81	45.7
Bowel resection	37	20.9
Drainage of abscess	3	1.7
Splenectomy	10	5.6
Adhesiolysis	17	9.6
By-pass surgery	4	2.3
Total	177	100.0

DISCUSSION

Acute abdomen is one of the most common presentation in emergency department of hospitals.^{8,9,10} A large number of the clinical cases of acute

abdomen are classified as “non-specific abdominal pain” after clinical evaluation and investigations.^{9,10,11,12} Acute abdomen constitute 7-10% of admissions in emergency departments.^{8,9,10,13} Out of these number, 15-44% are classified as non-specific abdominal pain^{10,11,12} Most of these cases of non-specific abdominal pain do not require surgical intervention and usually resolve on conservative management.^{10,11} This study focused on cases of acute abdomen managed surgically and constitute 9.28% of all the surgeries done during the study period. This is similar to the study done by Hagos in Ethiopia who recorded 299 surgical emergency conditions for acute abdomen out of 2628 surgical procedures performed, accounting for 11.4% of all surgeries.¹⁴

The age range for the current study is 4-85 years with a mean of 33.98±17.57 years. This included paediatric patients and is slightly different from age range of 16-90 years in a similar study by Agboola *et al.* who like the present study excluded Obstetric and Gynaecological cases but studied only adult patients.¹ The peak age groups were 11-20 years and 21-30 years (Figure 1). This is similar to peak of 16-25 years in the study by Agboola *et al.* The male to female ratio in this study is 1.08:1. This shows a slight male preponderance probably due to the exclusion of Obstetrics and Gynaecological cases. This is however widely different from the ratio of 2.5:1 recorded by Agboola in Nigeria, 2:1 by Kotiso and 4.1:1 by Hagos both in Ethiopia.^{1,5,14} The ratio in this study is

similar to 1.3:1 by Alagoa in Port Harcourt, Nigeria.¹⁵ There is female preponderance in the studies by Cervellin *et al* and Caporale *et al*.^{9,10}

The most common cause of acute abdomen in this study is acute appendicitis and its complications, constituting a total of 83(46.9%) of the patients. Of this total, 32.2% had straight forward acute appendicitis while 14.1% had ruptured appendix (Table 1). These values correspond to a range of 30.4-57.6% of the cause of acute abdomen documented in other studies.^{1,5,14,15,16} The combined peak age for appendicitis is between 11-30 years with peak age for ruptured appendix at 21-30 years group (Table 2). This peak age corresponds to second and third decades documented by Kotiso in 2006.⁵ Acute appendicitis is rare at extremes of ages and more difficult to diagnose at those age groups; with more presenting at complicated stages. This is largely due to poor localization of symptoms with resultant late presentation.^{13,17}

In this study, more females presented with early stages of acute appendicitis with male to female ratio of 1:2.6 while more males presented with a ruptured appendix with a male to female ratio of 1.8:1 (Table 3). These findings suggest that females have better health seeking behaviour than the male counterpart and more likely to present at early stages. The overall male to female ratio for early and complicated appendicitis is 1:1.6, giving a female preponderance. This is in contrast to a male preponderance with a male to

female ratio of 3.4:1 recorded by Agboola in 2014.¹

The second most common cause of acute abdomen in this study is intestinal obstruction which constituted 29.9% of all the cases. This is similar to the finding in other studies where intestinal obstruction was demonstrated as the second commonest cause of acute abdomen.^{1,5,14} However, it is the third most common cause after acute appendicitis and abdominal trauma in a study by Alagoa and Jebbin in Port Harcourt.¹⁵ Out of this, 25(14.1%) resulted from post-operative bands while 28(15.8%) were as a result of colonic tumours (Table 1). This value of 29.9% is huge with post-operative bands making up 47.2% of the total cases of intestinal obstruction. The value from post-operative bands in this study is higher than 31.2% documented by Agboola.¹ This is most likely a result of increased number of laparotomies being performed in our environment despite the fact that intestinal obstruction from external hernias were not included in the current study as was the case in the study by Agboola.¹

The third most common cause of acute abdomen in this study is perforated peptic ulcer disease (PPUD) which accounted for 17(9.6%) of cases (Table 1). This is quite significant and shows that PPUD is very common in our environment. In a similar study by Agboola in 2014, he found out that PPUD was the fourth most common cause of acute abdomen.¹ In the same study, he also found that 80% of the patients with PPUD had history of abuse

of non-steroidal anti-inflammatory drugs (NSAIDs). In other studies, Kotiso found PPUD to be third most common cause, accounting for 9% of cases while Hagos found that PPUD was the fourth commonest cause of acute abdomen and accounting for 4.3% of their cases.^{5,14} In the current study, PPUD shows male preponderance with a male to female ratio of 7.5:1 (Table 3). There is also a similar male preponderance with a ratio of 4:1 in the study by Agboola.¹

Abdominal trauma is the fourth leading cause of acute abdomen accounting for a total of 16(9.0%) of all the cases in this study. The study also shows a male preponderance with a male to female ratio of 15:1 (Table 3). This is probably because the males are more adventurous and tend to be more involved with travelling. In a study by Alagoa in Port Harcourt, abdominal trauma was the second most common cause of acute abdomen after acute appendicitis and accounted for 25.6% of their cases.¹⁵

In this study, a total of 12 patients had various complications following surgery, giving a complication rate of 6.8%. This value in the index study is significantly lower than values obtained in similar studies: 30.8% by Hagos; 28.0% by Kotiso and 18.9% by Alagoa.^{5,14,15} Mortality rate of 2.8% in this study is lower than 6.4%, 10.0% and 14.0% recorded by Hagos; Alagoa and Kotiso, respectively.^{5,14,15} The contributors of mortality in this study are perforated peptic ulcer disease in 40%, typhoid perforation in 20%, ruptured appendix in 20% and intestinal

obstruction in remaining 20%. All the cases with mortality presented more than five days after onset of their abdominal pains.

CONCLUSION Acute appendicitis and its complications still remains the most common cause of acute abdomen. While mortality rate from acute abdomen is low at 2.8%, perforated peptic ulcer disease has the highest case fatality. Mortality is worse in the late presenters. Early presentation may improve outcome.

REFERENCES

1. Agboola JO, Olatoke SA, Rahman GA. Pattern and presentation of acute abdomen in a Nigerian teaching hospital. *Niger Med J* 2014; 55:266-270.
2. Stoker J, van Randen A, Laméris W, Marja A. Boermeester. Imaging Patients with Acute Abdominal Pain. *Radiology* 2009; 253(1): 31-46.
3. Gore RM, Miller FH, Pereles FS, Yaghmai V, Berlin JW. Helical CT in the Evaluation of the Acute Abdomen. *American Journal of Roentgenology* 2000;174: 901-913.
4. Kameoka S, Ogawa S. Acute Abdomen in Pregnancy *JMAJ* 2001; 44(11): 496-500.
5. Kotiso B, Abdurahman Z. Pattern of acute abdomen in adult patients in Tikur Anbessa Teaching Hospital, Addis Ababa, Ethiopia. *East and Central African Journal of Surgery* 2007; 12(1):47-52.
6. Jones RS, Claridge JA. Acute abdomen. In: Townsend CM, Beauchamp RD, Evers BM, *et al.*, editors. *Sabiston Textbook of Surgery: The Biologic basis of Modern Surgical Practice*. 17th ed. Philadelphia: Elsevier; 2004. pp. 1219-1238.
7. Macaluso CR, McNamara RM. Evaluation and management of acute abdominal pain in the emergency department. *Int J Gen Med* 2012; 5:789-797.
8. Gans SL, Pols MA, Stoker J, Boermeester MA. Guideline for the Diagnostic Pathway

- in Patients with Acute Abdominal Pain. *Dig Surg* 2015; 32:23-31.
9. Caporale N, Morselli-Labate AM, Nardi E, Cogliandro R, Cavazza M, Stanghellin V. Acute abdominal pain in the emergency department of a university hospital in Italy. *United European Gastroenterol J* 2016; 4(2): 297-304.
 10. Cervellin G, Mora R, Ticinesi A, Meschi T, Comelli I, Catena F *et al.* Epidemiology and outcomes of acute abdominal pain in a large urban Emergency Department: retrospective analysis of 5,340 cases. *Ann Transl Med* 2016; 4(19): 362.
 11. Koyuncu N, Karcioğlu O, Sener S. Nonspecific abdominal pain: A follow-up survey. *Niger J Clin Pract* 2018; 21:332-6.
 12. Grundmann RT, Petersen M, Lippert H, Meyer F. The acute (surgical) abdomen - epidemiology, diagnosis and general principles of management. *Z Gastroenterol* 2010;48(6):696-706.
 13. Hijaz NM, Friesen CA. Managing acute abdominal pain in pediatric patients: current perspectives. *Pediatric Health, Medicine and Therapeutics* 2017;8:83-91.
 14. Hagos M. Acute abdomen in adults: a two-year experience in Mekelle, Ethiopia. *Ethiop Med J* 2015;53(1):19-24.
 15. Alagoa PJ, Jebbin NJ. The changing pattern of acute abdomen in Port Harcourt, Nigeria. *Port Harcourt Medical Journal* 2009;4(2). Available at <http://dx.doi.org/10.4314/phmedj.v4i2.52382> [he1]. (Accessed 22/5/2018)
 16. Laal M, Mardanloo A. Acute Abdomen; Pre and Post-Laparotomy Diagnosis. *International Journal of Collaborative Research on Internal Medicine & Public Health* 2009;1(5):157-165.
 17. Lyon C, Clark DC. Diagnosis of Acute Abdominal Pain in Older Patients. *Am Fam Physician* 2006;74(9):1537-1544.