

A Prospective Study on Acute Abdomen at Agogo Presbyterian Hospital (APH), Ghana: Identification of Common Causes and Pattern of Presentation

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Abstract:-

➤ Background

Acute abdomen is the most common presenting surgical emergency in the world and due to its varied etiology; it poses significant diagnostic challenges for physicians.

➤ Objective

To examine the demographics and presentation patterns of patients with acute abdomen (AA) who sought treatment at Agogo Presbyterian Hospital (APH). To determine the most common causes of AA, evaluate accuracy of diagnosis by comparing pre-operative and post-operative diagnosis of AA and determine the morbidity and mortality associated with management of the condition at APH.

➤ Methods

A descriptive, observational cross-sectional studies which included all cases of AA diagnosed at APH within the set study period. Standard forms were the primary tool used for data collection. The variables studied include patient demographics, clinical features, pattern of presentations, complications and mortality. Data gathered were coded and analyzed with the Statistical Package for Social Sciences (SPSS) version 25.0

➤ Result

There were 26 patients, 11 males and 15 females. The ages ranged from 1 to 69. The most common causes of AA in APH were acute appendicitis 9(34.6%), intestinal obstruction 5(19.2%), perforated peptic ulcer disease 2(7.7%), typhoid ileal perforation 2(7.7%), acute cholecystitis 2(7.7%) and severe PID (7.7%). 15 patients underwent surgery (appendicectomy and exploratory

laparotomy being the common operations), 11 were managed conservatively. Three patients (11.5%) died, two of whom were cases of perforated peptic ulcer disease and died within three days of admission.

➤ Conclusion

This study highlights the need for accurate and prompt diagnosis of AA, as it can be life-threatening.

Keywords:- Acute Abdomen; Acute Appendicitis; Abdominal Pain; Peptic Ulcer Disease; Intestinal Obstruction; Ghana.

I. INTRODUCTION

Acute abdomen is a life-threatening abdominal condition that has been increasing in prevalence globally and is a common cause of admission to emergency departments. [1,2]. It is a symptom complex that constitutes a spectrum of surgical, medical, and gynecological conditions requiring hospital admission, investigation, and treatment. However, its relative incidence varies from place to place and among populations, and the causes of acute abdomen are several. [3] Therefore, a comprehensive understanding of the common causes, pattern of presentation, and diagnostic accuracy of acute abdomen is crucial for early diagnosis and prompt treatment. The most common causes of acute abdomen vary between developed and developing countries. For instance, acute appendicitis is the most common cause in developed countries, while hernia and volvulus are most frequent in African countries.[4] In West Africa, typhoid fever with ileal perforation is also a common cause. Despite these findings, little information is available about the pattern of presentation of the etiologic spectrum of conditions resulting in acute abdomen and factors affecting management outcome such as diagnostic accuracy, especially in low

resource settings. There is therefore the need to find out the pattern of the disease and understand the background of patients with acute abdomen and improve patient health within few days considering the impact of its complications, longer hospital stays, the financial burden and death especially in low resource settings.

➤ *Purpose of the Study*

The study is intended to find out the frequencies and patterns of different diseases presenting as acute abdomen specific to the locality where the study is carried out; To judge the importance and accuracy of clinical diagnosis by comparing pre-operative and postoperative diagnosis; To acquaint ourselves of the rare causes of acute abdomen presenting in the common way managed at the Agogo Presbyterian Hospital and prognostic features influencing management outcome to further aid the effective medical and surgical management of patients with acute abdomen.

➤ *Objectives*

• *Main Objectives*

To find the most common causes (etiological spectrum) of acute abdomen, the pattern of presentation of patients with acute abdomen and prognostic factors influencing management outcome.

• *Specific Objectives*

- ✓ To determine the most common causes of acute abdomen
- ✓ To evaluate accuracy of diagnosis by comparing pre and post operative diagnosis of acute abdomen
- ✓ To identify the age, sex, occupation, and describe the pattern of presentation of patients affected with acute abdomen who reports to APH for management.
- ✓ To determine the morbidity and mortality associated with management of the condition at APH

• *Research Questions*

- ✓ What are the most common causes of acute abdomen?
- ✓ What is the accuracy of pre-operative diagnosis to post-operative diagnosis?
- ✓ What is the age, sex, occupation and pattern of presentation of patients with acute abdomen?
- ✓ What is the morbidity and mortality associated with the management of the condition at APH?

• *Limitations of the Study*

- ✓ Time constraint-The time was too short to enable extensive recruitment of patients.
- ✓ Financial constraints
- ✓ Since the study was dependent on medical records, inferences drawn from the comparison of pre-operative and post-operative diagnosis and treatment outcomes may have been underestimated due to exclusion of incomplete records. Hence, selection bias is possible in this study.

II. METHODS

This was a prospective descriptive observational cross-sectional study carried out from October 2020 to February 2021 (period of 4 months) in the Agogo Presbyterian hospital, Ghana.

Data was collected from the medical records of patients to determine parameters such as age, sex, clinical presentation, duration of symptoms, pre-existing conditions, type of operation, post-operative diagnosis, and outcome in terms of morbidities and mortalities. The duration of symptoms was defined in days, and diagnoses were based on detailed history, physical examination, and investigative findings.

➤ *Research Design*

Descriptive observational cross-sectional study was used to describe acute abdomen that presents at the Agogo Presbyterian Hospital. The study employed descriptive method to describe the characteristics of patients with acute abdomen, common causes of acute abdomen, the pattern of presentation of patients with acute abdomen and prognostic factors influencing management outcome.

➤ *Research Settings*

The study was conducted at Agogo Presbyterian Hospital, a mission hospital in the Asante Akyem District-Ashanti Region. The hospital has specialized units and is accredited for housemanship training in medicine, surgery, paediatrics and obstetrics/gynaecology, and as a training centre for Buruli ulcer treatment. It was selected for the study because it receives nearly all cases of acute abdomen in the area.

➤ *Study Population*

The study population consisted of cases of acute abdomen diagnosed at APH within the four-months study period.

➤ *Inclusion Criteria*

Patients of all age group both males and females who have had any of the etiological spectrums of acute abdomen diagnosed at APH and consented to the study were recruited for the studies.

➤ *Exclusion Criteria*

The study excluded patients without a confirmed diagnosis of acute abdomen, those who were not admitted (OPD cases), patients less than one year old, those with incomplete medical records, and those who could not take full treatment due to financial, social, or other constraints.

➤ *Sample Size and Sampling Method*

Purposive or Convenient sample technique which is a non-probability sampling method were used to select all cases of acute abdomen that presented at the Agogo Presbyterian hospital within the period who gave consent to be included in sample size of respondents.

➤ *Method of Data Collection*

To collect data for the study, we used standardized collection forms and explained the purpose of the study to patients in a language they could understand. The forms were used to collect information on patient demographics, clinical features, presentation patterns, complications, and mortality. The collected data was then subjected to reliability and validity tests, and both descriptive and inferential statistical tools were used to analyze the data, in order to accurately describe the characteristics of the participants and identify any associations among the variables studied.

➤ *Method of Data Analysis*

Information gathered from the standardized form was coded and analyzed using a Statistical Package for the Social Sciences (SPSS) version 25.0. The results were presented by means of table, plot diagrams and graph.

➤ *Ethical Considerations*

Permission was obtained from the Agogo Presbyterian Hospital Directorate. Permission was obtained from the district health director of health services. Written informed consent was obtained from respondents. Respondents were assured of confidentiality.

III. RESULTS

A. *Statistical Analysis*

➤ *Demographics*

During the four months study period, there were twenty-six (26) confirmed cases of acute abdomen of varying etiologies in the Agogo Presbyterian hospital. 57.7% (15) of these cases were managed surgically (operative cases) while the remaining 42.3% (11) managed conservatively (non-operative cases). There were 11(42.3%) males and 15(57.7%) females with male to female ratio of 1:1.4 respectively. The age ranged from 01 to 69 with a mean age of 31.46 ± 17.4 (SD) years. Highest number of patients was from the age group 20-29. 57.7% (15) of the study population were insured under the National Health Insurance Scheme while the remaining 42.3% (11) were not insured. There were 12(46.2%) farmers among the study population followed by 7(26.9) traders, 5(19.2%) students, 1(3.8%) hairdresser and 1(3.8%) unemployed. Of these, 15(57.7%) were illiterate, 6(23.1%) have had basic education, 4(15.4%) have had secondary education and 1(3.8%) have had tertiary education. 11(42.3%) among the 26 cases were referred from other health facilities while the remaining 15(57.7%) were diagnosed at APH.

➤ *Patient Presentation*

• *Clinical Features*

In this study, abdominal pain(100%) was the major symptom presented in patients with acute abdomen while vomiting 22(84.6%), nausea 10(38.5%), anorexia 8(30.8%), fever 7(26.9%), constipation 4(15.4%), chills 3(11.5%), melena stools 2(7.7%), general body weakness 1(

3.8%), hemochezia 1(3.8%),dysuria 1(3.8%), itching 1(3.8%) and weight loss 1(3.8%) were also present.

• *Clinical Signs*

Clinical signs elicited in the study include abdominal tenderness 26(100%), Rebound tenderness 21(80.8%), abdominal guarding 19(73.1%), abdominal distention 10(38.5%), rovsing sign 8(30.8), psoas sign 3(11.5%) and jaundice 1(3.8%).

➤ *Pattern of Presentation*

Pattern of presentation of acute abdomen was demarcated in relation to the pain, into onset, location, intensity, frequency, character, radiation/referral and duration of symptoms before presentation in this study. It also took into account pre-existing conditions prior to the development of acute abdomen. (Table 1)

14(53.8%) patients presented with sudden onset of pain while the remaining 12(46.2%) were of gradual onset. (Table 1)

Location of pain in this study was partitioned into central abdomen, upper abdomen, lower abdomen and generalized location. 11(42.3%) of the 26 cases had pain in their lower abdomen, followed by 7(26.9%) in the generalized location, 5(19.2%) in the upper abdomen and 3(11.5%) in the central abdomen.

Intensity of pain was accessed by using the pain rating scale. 25(96.2%) patients among the total cases had severe pain (greater/equal to 8) while the remaining patient (3.8%) had a moderate pain during admission. ($\geq 5 \leq 8$)

Frequency of pain was either constant or intermittent in this study and among these options, 15(57.7%) patients presented with constant pain whereas the remaining 11(42.3%) were of an intermittent frequency.

In terms of character of pain, 11(42.3%) described their pain as cramping, 4(15.4%) had colicky pain, 2(7.7%) were sharp while the remaining 9(34.6%) patients were not able to describe (vague).

As regards radiation/referral of pain, 16(61.5%) of j patients had no radiation/referral of pain, 7(26.9%) were unable to express, 2(7.7%) had their pain radiating/referring to the epigastrium and 1(3.8%) to the back.

The duration of symptoms ranged from 4hours to 7days (mean=3.0). 11(42.3%) presented in less than two days (within 48hours) whereas 15(57.7%) presented to the hospital after two days.

Among the 26 cases, 17(65.4%) had no pre- existing condition prior to the development of acute abdomen but then 3(11.5%) were hypertensive, 3(11.5%) were peptic ulcer disease patients, 1(3.8%) was diagnosed of chronic kidney disease and 2(7.7%) were pregnant.

Table 1 Displaying the Pattern of Presentation

Variables	Frequency	Percentage (%)
Onset Of Pain		
Sudden	14	53.8
Gradual	12	46.2
Total	26	100.0
Location Of Pain		
Central Abdomen	3	11.5
Upper Abdomen	5	19.2
Lower Abdomen	11	42.3
Generalized	7	26.9
Total	26	100.0
Intensity Of Pain		
Severe	25	96.2
Moderate	1	3.8
Total	26	100.0
Frequency Of Pain		
Constant	15	57.7
Intermittent	11	42.3
Total	26	100.0
Character Of Pain		
Colicky	4	15.4
Cramping	11	42.3
Sharp	2	7.7
Vague/Can't Describe	9	34.6
Total	26	100.0
Radiation/Referral Of Pain		
None	16	61.5
Back	1	3.8
Unable To Express	7	26.9
Epigastrium	2	7.7
Total	26	100.0
Duration Of Symptoms		
Less Than Two Days	11	42.3
Greater Than Two Days	15	57.7
Total	26	100.0
Pre-Existing Condition Prior To Acute Abdomen		
Chronic Kidney Disease	1	3.8
Hypertension	3	11.5
None	17	65.4
Peptic Ulcer Disease	3	11.5
Pregnancy	2	7.7
Total	26	100.0

➤ *Common Causes of Acute Abdomen*

On analyzing the spectrum of disease in all the 26 cases, it was found out that acute appendicitis was the most common causes of acute abdomen which was found in 9(34.6%) followed by intestinal obstruction in 5(19.2%), perforated peptic ulcer disease in 2(7.7%), typhoid ileal perforation in 2(7.7%), acute cholecystitis in 2(7.7%), severe pelvic inflammatory disease(PID) in 2(7.7%) of the total patients studied and one case each of acute pancreatitis (3.8%), acute gastritis (3.8%), ruptured ectopic pregnancy (3.8%) and spontaneous bacterial peritonitis (3.8%).(Table 2)

In summary, there were 23(88.5%) gastrointestinal causes of acute abdomen (medical and surgical) with the remaining 3(11.5%) of gynecological causes.

Table 2 Displaying the Common Causes of Acute Abdomen

Condition	Frequency	Percentages
Acute appendicitis	9	34.6%
Intestinal obstruction	5	19.2%
Perforated PUD	2	7.7%

Typhoid Ileal perforation	2	7.7%
Acute cholecystitis	2	7.7%
Severe PID	2	7.7%
Acute pancreatitis	1	3.8%
Acute gastritis	1	3.8%
Ruptured ectopic pregnancy	1	3.8%
SBP	1	3.8%
TOTAL	26	100%

➤ *Pre-Operative and Post- Operative Diagnosis*

There were 3(11.5%) wrong pre-operative diagnosis out of the total 15 surgically managed cases in comparison with the post-operative diagnosis (Table 3).

Table 3 Displaying Pre- Operative and Post- Operative Diagnosis of Acute Abdomen

Pre-Operative Diagnosis					
		Frequency	Percent	Valid Percent	Cumulative Percent
	Acute Appendicitis	9	34.6	60.0	60.0
	Intestinal Obstruction	4	15.4	26.7	86.7
	Perforated peptic ulcer disease	2	7.7	13.3	100.0
	Total	15	57.7	100.0	
Post-Operative Diagnosis					
	Acute Appendicitis	8	30.8	53.3	53.3
	Intestinal Obstruction	2	7.7	13.3	66.7
	Typhoid Ileal Perforation	2	7.7	13.3	80.0
	Ruptured Ectopic Pregnancy	1	3.8	6.7	86.7
	Appendicitis In Pregnancy	1	3.8	6.7	93.3
	Perforated peptic ulcer disease	1	3.8	6.7	100.0
	Total	15	57.7	100.0	

➤ *Morbidity and Mortality*

• *Morbidity*

Post-operative complications occurred in 2(7.7%) patients in the study. The post-operative morbidity that occurred is abdominal compartment syndrome and wound infection. It was dressed and treated. Among the 11(42.3%) non- operated patients, 2(7.7%) developed complications which were shock and spontaneous bacteria peritonitis. The rest of the patients did not develop any complications.

• *Mortality*

The overall mortality present in this study was 11.5%. There was 3.8% (1) post-operative mortality and 7.7% (2) non- operative mortality. There were all non- insured farmers who had pre-existing conditions. The causes of death were shock due to rupture of intra-abdominal viscous (PUD), abdominal compartment syndrome following perforated PUD operation and spontaneous bacteria peritonitis. All these deaths occurred within 3 days of admission with 67% (2/3) occurring within 48hours.

IV. DISCUSSION

Acute abdomen is the most common presenting surgical emergency in all part of the world. Despite improvement in clinical evaluations and advancement in diagnostic methods, correct diagnosis of acute abdomen is still sometimes difficult. [5]

In this study, out of the 26 consecutive patients recruited into this study, 11 were males while 15 were females with a male to female ratio of 1: 1.4. There was a female dominance in this study which is consistent with findings of A. Murata et al., 2014(Ethiopia) but in contrast with study findings of Professor Ohene M. Yeboah who reported male dominance in his six years prospective study on 3114 patients in Kumasi, Ghana and other researchers across the globe [6–8]. The mean age of patients was 31.46±17.4 years with age range of 1 to 69 which is similar in findings to a study conducted by Gebrie et.al who reported the same age range and mean but inconsistent with study findings from Laal M and Mardanloo A who reported mean age of 35.3±18.6 with age range of 9-85. Majority of patients were in their second and third decades of life consistent with study findings in tertiary hospitals in India and Kigali teaching hospital. [9]

The duration of symptoms ranged from 4 hours to 7 days with mean of 3.0 days and 15(57.7%) patients came to the hospital after two days consistent with findings of Gebrie et.al, 2009 but just like in a study conducted in Kigali teaching hospital by Nyundo M et.al, the duration of symptoms had no association with morbidity and mortality in this study. The commonest symptom in this study was abdominal pain (100%) followed by vomiting (84%). In a study conducted by Beyene H et.al in 2019, the commonest symptom was abdominal pain (100%) followed by vomiting (80%) consistent with findings of Chanana et.al reporting abdominal pain (100%) as the commonest symptom

followed by vomiting (57.2%), hence, symptoms in this study have similar findings compared with studies mentioned earlier with abdominal pain and vomiting as the commonest symptoms observed in patients with acute abdomen. In general, abdominal pain (100%), vomiting (84%), nausea (38.5%), anorexia (30.8%), fever (26.9%) and constipation (15.4%) were the common presenting complaints in this study which is in agreement with other studies [10–12]. The commonest sign elicited in this study was abdominal tenderness (100%) followed by rebound tenderness (80.8%) and abdominal guarding (73.1%) consistent with other study findings [6,12]. Common things occur commonly, and as acute appendicitis is the most common cause of acute abdomen across the globe so was it the most common cause in this study followed by intestinal obstruction, gastro-duodenal and typhoid ileal perforation which is in agreement with findings of Professor Ohene M. Yeboah and other researchers worldwide. [3,13] However, these findings were inconsistent with the results of SB Naaeder and EQ Archampong's study conducted in Accra, Ghana.

The pattern of presentation of acute abdomen in Africa especially Sub-Saharan Africa follows almost the same pattern as acute appendicitis, intestinal obstruction, perforated peptic ulcer disease and typhoid ileal perforation but then this differs from that of the developed world ; for instance, in a study conducted from Boston, Massachuset(USA), urinary tract stone(31.4%), appendicitis(23.6%), intra-abdominal abscess(17%), diverticulitis(16.9%) and small bowel obstruction(10.6%) were the commonest cause of acute abdomen. [14,15]

Pre-operative diagnosis was wrong in 20% (3/15) of surgical cases indicating the need for using other diagnostic tool besides detailed history, clinical examination and routine investigations as proposed by Dr. Muhammad Asif et.al in their study on the causes of acute abdomen in 2002.

The overall mortality in this study was 11.5% which is lower than the study done in Tikur Anbesa Specialized hospital (18.6%) and Goba referral hospital (16%) but higher than study done in Mekelele and Nekemte referral hospitals which shown 2.4% and 3.05% mortality rate respectively.[4,9] The most fatal cause of acute abdomen in this study was perforated peptic ulcer disease. These deaths can be attributed to the fact that they were all non- insured illiterate farmers who had pre-existing conditions and aged above forty-years.

V. CONCLUSION

Acute abdomen remains the most common presenting surgical emergency that poses diagnostic challenges for physicians due to its varied etiology. The results showed that the most common causes of acute abdomen in the APH were acute appendicitis and intestinal obstruction, with most cases being managed surgically. The study also showed that the accuracy of diagnosis was relatively high and that the morbidity and mortality associated with the management of acute abdomen were low. However, it is important to note

that some patients died after developing post-operative complications or while awaiting surgery, highlighting the need for prompt and effective management of this condition. Moreover, it was revealed in this study that illiterates were most affected in terms of prevalence, development of morbidities and mortalities hence public health initiatives targeting these people should be initiated to empower them about healthy living, compliance to medication when diagnosed of any chronic condition and ensuring that they are registered under the National Health Insurance Scheme so they can enjoy all the benefits that comes with it.

➤ *Guarantor*

I accept full responsibility for the work, had access to the data and made decision to publish.

➤ *Declaration of Competing Interest*

There is no conflict of interest in this study.

➤ *Declaration on Ethical Considerations*

Research was approved by Presbyterian University College Ghana Institutional Review Board. Permission was obtained from the Agogo Presbyterian Hospital Directorate. Permission was obtained from the district health director of health services. Written informed consent was obtained from respondents.

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