

Patterns of Abdominal Surgical Emergencies of Patients Treated at Ambo Referral Hospital from January 1, 2018 to December 30, 2019, Oromia Regional State, Ambo, Ethiopia

Leta Alemu Diba¹, Abel Ambaye Anfucho^{2, *}

¹Jimma University Medical Center, Jimma, Ethiopia

²Dr. Bogalech Gebre Memorial General Hospital, Durame, Ethiopia

Email address:

letalex1995@gmail.com (Leta Alemu Diba), abelambaye31@gmail.com (Abel Ambaye Anfucho)

*Corresponding author

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Abstract: Acute abdomen is an acute onset of abdominal disease entities that require immediate surgical intervention in most of the cases. It is the commonly encountered emergency in the practice of general surgery but there was no much information regarding its magnitude in our country. *Objective:* This study had assessed the pattern of acute abdomen of patients surgically treated at Ambo referral hospital from January 2018-Dec. 2019. *Methodology:* This study was conducted at Ambo referral hospital and retrospective analysis of surgically treated acute abdomen patients from January 2018-Dec. 2019. C. Enrolled patients medical record number was collected from surgical operation registration book and the charts were collected from chart collection room. *Results:* During this study period there were total of one hundred and eleven (111) patients admitted with diagnoses of acute abdomen and surgically treated on emergency basis. Males were more affected than females and most affected group were young age falls in 2nd and 3rd decades. The most common presenting symptoms were abdominal pain and vomiting whereas abdominal tenderness and distension were the leading signs. The leading causes of acute abdomen were acute appendicitis followed by intestinal obstruction and abdominal trauma. The investigation was ordered according to clinical diagnoses to aid/ confirm diagnoses. Post-operative stay was relatively similar with studies conducted in some part of the country and all over the world. In the study period above 90% were discharged with improvement where as 9% were died. *Conclusion:* This study depicted the commonest presenting symptoms and signs, most common etiology of acute abdomen and pre and post op stay which affected the outcome. Still some variables need deep study like why trauma becomes a 3rd leading cause and less affected females.

Keywords: Acute Abdomen, Acute Appendicitis, Laparotomy

1. Introduction

Acute Abdomen is an acute on set of abdominal disease entities that require immediate surgical intervention in most of the cases. The causes of acute abdomen are several, with variable incidence in different population. There may be variety of reasons for differences and outcome of intervention. Though causes vary the commonly observed ones are sigmoid volvulus, acute appendicitis, intestinal obstruction and trauma to abdomen are few of them. [9]

In our country the leading cause of acute abdomen

according to one research is sigmoid volvulus. Sigmoid volvulus is an abnormal twisting of the bowl on its mesenteric axis greater than 180 degree which produces obstruction of intestinal mesenteric lumen and mesenteric vessels only satisfactory long mesenteric axis as the case of long sigmoid colon allows it's torsion. [11]

Acute and severe abdominal pain is common and often sequential presentation of patient with acute abdomen it may be the sole indicator of the need for surgery and must be attended to swiftly. Gangrene and perforation of the gut can occur in less than 6 hours of onset of symptoms abdominal

pain is of particular concern in patients too young or old. The main modality of intervention of such patient is surgery and the outcome is very nice, but delaying diagnosis and intervention can lead to death. [10]

In the developed world acute abdomen is most common in the age group 20 to 29 years with male predominance; acute appendicitis is the most common cause of surgical condition [15]. Perforated appendicitis was the commonest cause of acute abdomen in children and was more prevalent in children aged 10-14 years, and was associated with increased morbidity, mortality and prolonged hospital stay [13].

On the other hand in several African countries the leading cause of acute abdomen is intestinal obstruction. In turn, the leading causes of intestinal obstruction in Africans have mostly been hernia and volvulus whereas adhesions are most frequent in the developed world. There is however some African studies which are pointing to a change in these established patterns [16].

In Ethiopia very little is known about general pattern of acute abdomen, especially in Dire-Dawa where one of the risk factor, "khat" chewing, is commonly practiced in the area [18].

In general the causes of acute abdomen are inflammatory obstructive and vascular mechanism and are manifested by sudden onset of abdominal pain, gastrointestinal symptoms and varying degrees of local and systemic reactions, some of the common causes are acute appendicitis, intestinal obstruction, perforated PUD, blunt and penetrated abdominal injuries [2].

2. Methods

1) Study area and Period

Ambo Referral Hospital is found in Ambo town, which is 112km from Addis Ababa in west direction. The hospital has four major departments: Internal Medicine, Surgery, Pediatrics and Gynecology and Obstetrics. It has three specialist's one surgeon and two gynecologist and 28 general practitioners. The department of surgery has 70 beds for adults in two wards, septic and aseptic wards, and 40 beds for pediatrics. The major OR gives daily duty for emergency patients and two days per week for elective patients.

The study was conducted over two-year period from January 1, 2018 – December 30, 2019.

2) Study Design: Retrospective study was used.

3) Population

a) Source Population: All surgical patients admitted to surgical ward during the study period.

b) Study population: All cases admitted with acute abdomen during study period.

4) Sampling size and Sampling Technique

All cases of abdominal surgical emergency admitted to surgical ward and operated on emergency bases with full information during study period were included. Patients who have no complete information on their charts were excluded from the study.

5) Data Collection technique

Charts were collected using respective medical record numbers taken from operation room registry log book. The necessary information filled on pre prepared questionnaire the principal investigator.

6) Data quality assurance

The data was checked for its completeness and was coded every day. Those dates incomplete about patient's information were excluded.

7) Data Analysis

After collection of data, they were analyzed by SPSS version 21.0 software package window.

3. Operational Definitions

Acute abdomen: - disease of the abdomen that needs emergent surgical intervention.

Laparotomy: - Operating of patients for the purpose of diagnoses as well as treatment.

Surgical intervention: - Treatment given for the patient by operation.

Volvulus: When a loop of intestine twists around itself and the mesentery that support it.

Acute appendicitis: Inflammation of appendicitis.

4. Results

In this study period a total of 111 laparotomies were done in emergency basis. From this 83 (74.8%) were males and 28 (25.2%) were females with male to female ratio \approx 3:1, ages range from 8 months to 76 year from this many age groups fall with in age range of 15 -37 years of age) which accounts 63%.

Table 1. Age and Sex distribution of patients with acute abdomen surgically treated at Ambo referral Hospital from January1, 2018 to December 30, 2019.

Age in Year	Sex		Total No. (%)
	Male No (%)	Female No. (%)	
<15	20	9	29 (26.13)
15 – 29	28	7	35 (31.5)
30-44	23	8	31 (27.9)
45-59	5	3	7.2 (8)
>60	7	1	7.2 (8)
Total	83	28	111 (100%)

The most common presenting symptoms were abdominal pain 105 (94.6%), Vomiting 75 (65.7%), abdominal distension 65 (58.5%) constipation 33 (29.7%) and trauma to abdomen 22 (19.8%).

Table 2. Symptoms distribution of patients with acute abdomen surgically treated at Ambo referral Hospital from January1, 2018 to December 30, 2019.

Symptoms	No (%)
Abdominal Pain	105 (94.6%)
Vomiting	75 (65.7%)
Distension	65 (58.5%)
Constipation	33 (29.7%)
Trauma to abdomen	22 (19.8%)

The most common sign detected during physical examination performed was tenderness 78 (70.2%), wound or bruise on the abdomen 22 (19.8%) from which wound detected in 12 cases (10.8%), Rebound tenderness 53 (47.8%) un-recordable BP 17 (15.3%), abdominal distension 59 (53.2%), guarding tenderness 26 (23.4%).

Table 3. Sign distribution of patients with acute abdomen surgically treated at Ambo referral Hospital from January 1, 2018 to December 30, 2019.

Sign	No (%)
Tenderness	78 (70.2%)
Wound on the abdomen	12 (10.8%)
Rebound tenderness	53 (47.8%)
Un-recordable BP	17 (15.3%)
Abdominal distension	59 (53.2%)
Guarding tenderness	26 (23.4%)

In our study period the time of stay before coming to health institution from the beginning of the symptoms is: most the patients fall between 2-4 days accounting 43 (38.7%) and <2 days accounts 35 (31.5%) the rest of patients present after 4 days of symptoms started 33 (28.7%). The duration of chief complaint ranges from 10 hours to 8 days with mode of 3 days.

Table 4. Duration of chief complaints in days of surgically treated patients of acute abdomen at Ambo referral Hospital from January 1, 2018 to December 30, 2019.

Duration of chief complaint days	No (%)
<2 days	35 (31.5%)
2 – 4 days	43 (38.7%)
5 – 7 days	23 (20.7%)
>7 days	10 (9.1%)
Total	111 (100.0%)

The most common pre-operative diagnoses are listed as follows in decreasing order of frequency acute appendicitis 33 (29.8%), small bowel obstruction 26 (23.4%), trauma to abdomen 22 (19.8%), large bowel obstruction 13 (11.7%), incarcerated and strangulated hernia 11 (9.9%), perforated PUD.

Table 5. Percentage of pre-operative diagnoses of patients surgically treated of acute abdomen at Ambo referral Hospital from January 1, 2018 to December 30, 2019.

Diagnose	Frequency	%
Appendicitis	33	29.8
Small bowel obstruction	26	23.4
Large bowel obstruction	13	11.7
Perforated PVD	2	1.8
Trauma to abdomen	22	19.8
Hernia/incarcerated, strangulated	11	9.9
* Others	4	3.6
Total	111	100%

* TB enteritis
G. Peritonitis 2° Gynecologic Surgery
Leakage of anastomosis

During our study period for 58 (52.3%) of patients laparotomy was done between 1 to 2 hours of arrival at Emergency room followed by 2-4 hours which accounts 21

(18.9%), fourteen causes (12.6%) operated within one hour of arrival others were operated after 4hrs of arrival. The delayed interventions in the 2nd cases were to investigation and operation theatre occupied at that time.

Table 6. Frequency of hospital stay before operation in hours of patients surgically treated of acute abdomen at Ambo referral Hospital from January 1, 2018 to December 30, 2019.

	No.	%
< 1 hours	14	12.6
1-2 hours	58	52.3
2-4 hours	21	18.9
>4 hours	18	16.2

For all patients who underwent emergency laparotomy with the pre-operative diagnoses the post-operative diagnoses were also assessed. Similar to pre-operative diagnoses the leading cause of acute abdominal emergency were acute appendicitis 31 (27.93%) small bowel obstruction 27 (24.32%) followed by abdominal trauma 22 cases (19.22%).

Table 7. Percentage of post Op. diagnosis of patients surgically treated with acute abdomen at Ambo referral Hospital from January 1, 2018 to December 30, 2019.

	No.	%
Acute appendicitis	31	27.93
Small bowel obstruction	27	24.32
Large bowel obstruction	14	12.6
Abdominal trauma	22	19.82
Hernia (Strangulated, incarcerated)	11	9.91
Perforated PUD	2	1.82
* Others	4	3.6

* Typhoid Perforation
Gynecologic cases
Ruptured ectopic pregnancy
G. Peritonitis 2° gynecologic operation and TB peritonitis

21.6% of patients were discharged with in 72hrs of operation. Most of these patients were patients with hernia and mild abdominal trauma. 55% stayed between 3-7 days this is the day's most of the patients discharged from hospital. 26 (23.4%) of patients stay more than 7 days. Most of these patients are which develop post op. complication, and that presented late and with medical conditions, old age and very young age. From this patients those with abdominal trauma 2° bullet injury 3 (13.6%) and deep penetrated and bowel involved (6) (27.3) were included in more than 7 days hospital stay.

Table 8. Percentage distribution of post-operative hospital stay in days of patients of diagnosed with acute abdomen surgically treated at Ambo referral Hospital from January 1, 2018 to December 30, 2019.

	No.	%
Post Op. stay in days < 3 days	24	21.6
3-7 days	61	55.0
> 7 days	26	23.4
Total	111	100%

5. Discussion

In Retrospective analysis of two years from January 2018

– December, 2019, there were total of 111 patients who underwent emergency abdominal surgery. In this study males were more affected than females with ratio of $\approx 3:1$. Similar to other studies conducted in our country and other countries [1, 4, 8, 17, 11]. The most affected age group were between 15-29 followed by 30-44 accounting (31.5%) and 29, 7%) respectively which also agrees with study conducted at Gondar University Hospital and Tikur Ambessa Specialized Hospital [1, 5], were in both extremes of age there are few numbers of cases seen.

The most common presenting symptoms were abdominal pain (94.6%) vomiting (65.7%), followed by distension (58.5%) constipation and trauma to abdomen constitute 29.7%, and 19.8% respectively. This is also similar to studies done at Gondar University hospital and Tikur Ambessa Specialized Hospital and also to a study conducted at Tehran University of medical science, Iran [1, 4, 5, and 6].

The commonest physical finding detected at presentation was abdominal tenderness (70.2%) abdominal distension (53.2%) followed by rebound tenderness (47.8%). Similar to a study conducted at Tikur Ambessa Specialized Hospital B. Kotiso. The majority of patient present lately and about 38.7%, of patients presented to hospital within 2-4 day of illness, 31.5% come before two days of illness, 29.8% presented after 1 days of illness. The mode presentation day was 3 days; this shows more improvement because people get awareness of abdominal illness and effort of Health extension workers immediate refer of patients to health institution.

Pre-operative and post-operative diagnoses in our study population were almost equivalent this shows more prominent clinical features developed at presentation and in most of cases seniors were involved to decide pre-operative diagnoses.

These results were similar to study conducted at Tehran University of medical science Iran this comparison of pre and post-operative diagnoses were not found in research conducted on acute abdomen in our country.

Most of patients operated within 1-2 hours of arrival followed by 2-4 hours (18.9%), 12.6% were operated within one hour of arrival and 16.2 stay more than 4 hours assessing this time has its own importance on outcome of treatment and progression to death. Early presentation and immediate operation resulted with good out come and late presentation particularly and type of illness determines the outcome of patient. [14]

There is no research conducted in our country concerning of pre-operative hospital stay. The leading cause of acute abdominal emergency in our study were acute appendicitis (27.93%), small bowel obstruction (24.32%) followed by abdominal trauma (19.82) large bowel obstruction. Strangulated and incarcerated hernia accounts 9.91%. Similar to this study, study conducted at Nazareth, central Ethiopia, in Nigeria by Ajdo and Zaire by Okoro as well as study done Black Lion hospital, Addis Ababa [1] and Tehran university medical science, Iran (51.9) out acute appendicitis as leading cause of surgical abdominal emergency in contrast to this result study done at Gondar University hospital Ethiopia and

in Yirgalem Southern Ethiopia the leading cause was small bowel obstruction and acute appendicitis. According to our study result the 3rd leading cause of acute abdomen is trauma to abdomen with accounts 19.82% even though most literatures done on acute abdomen exclude trauma to abdomen, it is common public problem observed at this study in contrast to this research done at Jimma hospital, 1994 put trauma to abdomen the 1st leading cause of surgical abdominal emergency [6].

Most of patients stay between 3-7 days in hospital post operatively, 21.6 discharged within 3 days of operation the rest stay more than 7 days.

The overall mortality rate of emergency surgically treated acute abdomen was 9.0% which is lower when compared to study done in Yirgalem (31.5%) and Datubo (13.3%) [11, 12] and also lower than the study done at Tikur Ambessa Hospital 14.0% and Gondar University Hospital (9.3%) 50% of patients died were those present with small bowel obstruction, 20% were those with large bowel obstruction and 30% were patients with abdominal trauma. 60% cause of death was sepsis, 30% respiratory failure and 10% was 2^o anastomotic lead. Post-operative stay ranges from 1 days which is similar to other study [7] where are a two-patient died on the 1st post operation day, 2 on the 5th post op. day and one patient died on the 7th day. 90% patients are those presented after 3 days of illness and 60% of them are >55 years of age only one patient was less than 15 years of age from these only one female was included.

This result is too high when compared to research done in our country [1, 7]. This difference may be explained by different causes of intestinal obstruction/ acute abdomens are differed depending on different regions [1, 7]. The great difference in six ratios can be explained by lever of females in community, educational level and economic status.

6. Conclusion

Acute abdomen is a commonly encountered public problem in our study area. In the pattern of acute abdomen, there are some reasons that can change the pattern depending on the regions of the country where the study is conducted, age and food habit as well as health institution availability and qualified health personnel [1, 7]. The predominant presenting symptoms are abdominal pain and vomiting. The most affected groups were late adolescent and adult age, male sex was predominant were as the leading cause of acute abdomen is acute appendicitis followed by small bowel obstruction and the least common is perforated PUD and TB Peritonitis and generalized peritonitis. Most of the patients presented from 2-4 days of illness with made of 3 days. The pre and post op. diagnoses were almost equal.

Why male sex and adult population are commonly affected was probably due to high burden of work and types of food they eat as suggested by some authors. But it is not clear in this study why small bowel obstruction is the leading cause of death. This need deep study by other researchers it is good to recommend as it can help them to improve the overall

outcome of surgically treated patients.

7. Recommendation

The awareness about acute abdomen and health seeking behavior of the society should be improved by giving health education.

Physicians should compare pre-op. and post op. diagnoses and correlate signs and symptoms with post op. diagnoses to reduce future mis-diagnose and delay in intervention.

Everything done for patient starting from time of presentation to discharge or death should be documented which is essential for patients as well as research purposes.

Patients' residence, educational status economic status and occupation and other details should be recorded. On the top of this For this to be accomplished there should be a good referral system and effective way of health communication the health facilities should be accessible and equipped this conditions are unavailable in peripheries and remote areas, so the problem is much worse in developing country like Ethiopia, were communication is very poor, the infrastructure in health delivery system is weak and referral system is not properly analyzed [3].

Author Contributions

Both authors contributed significantly to the work that was published, whether it be in the ideation, study design, execution, data collection, analysis, and interpretation, or in each of these areas. They also participated in the writing, editing, and critical review of the article, gave their final approval for the version that would be published, decided on the journal to which the article would be submitted, and agreed to be held accountable for all aspects of the work.

Conflict of Interests

All the authors do not have any possible conflicts of interest.

Abbreviation

U/S: Ultra sound
PUD: Peptic Ulcer Diseases
U/A: Urinalysis
OR: Operation Room
AXR: Abdominal X-ray
WBC: White blood cell count

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