

Assessment of Non-Traumatic Acute Abdominal Cases Treated Operatively at Wolaita Sodo Teaching and Referral Hospital, Southern Ethiopia

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Abstract

Background-Acute abdomen is an acute onset of abdominal disease entities that require immediate surgical intervention in most of the cases. **Objective-**The aim of this study was to determine the magnitude, causes, presenting features and outcome of non-traumatic surgical acute abdomen cases at Wolaita Sodo University Teaching and Referral Hospital, Southern Ethiopia.

Methods- Hospital based cross-sectional study design was conducted on 270 patients operated for non-traumatic surgical acute abdomen from July 1, 2013 to June 30, 2015.

Results: - A total of 633 laparotomies were performed for both elective (210) and emergency (Traumatic (47) & Non-traumatic acute abdomen (376)) cases. A total of 376 laparotomies were on emergency non-traumatic acute abdomen, (59.4%) of all laparotomies. Out of 376 records, of which 270(71.8%) had adequate information for further analysis where retrieved at WSUTRH. Out of 270 cases, 196 were males and 74 were females. The age ranged from 3 months to 66 years with a mean age of 26.5 years. Two hundred thirty eight (88.1%) patients were from rural and 32 (11.9%) were from urban dwellers. Majority of patients, 63.3% (171) were presented within 2-5 days of illness before operation. The main presenting features were: abdominal pain, vomiting, constipation and abdominal distention; and they were reported among 99.3% (268), 92.2% (249), 62.6% (169), 53.3% (144) of the study subjects. The three top causes of non-traumatic surgical acute abdomen were bowel obstruction 49.3% (133), acute appendicitis 31.5% (85) and Peritonitis 19.2% (52). There were a total of 4% (11) deaths.

Conclusion: Complications and deaths were more in cases from rural area due to delay in presentation. To alleviate this problem, creating awareness on acute abdomen to the general population in general has great importance.

INTRODUCTION

Acute abdomen is the most common presenting surgical emergency. It is a term used to encompass a spectrum of surgical, medical and gynecological conditions, ranging from the trivial to life-threatening, which require hospital admission, investigation and treatment. Acute abdomen may be defined generally as an intra-abdominal process causing severe pain requiring admission to hospital, and which has not been previously investigated or treated and may need surgical intervention(1).

Abdominal pain is a common presentation that requires almost immediate management and clinical awareness plays an important role in the diagnosis and management. The majority of patients presenting with acute abdominal pain have associating symptoms (e.g., nausea, vomiting, diarrhea, constipation) that are often helpful in making a diagnosis. Additionally, constipation or obstipation may point towards an intestinal obstruction. A remote history of abdominal surgery may indicate that intestinal obstruction secondary to adhesive disease is the source of a patient's complaints [1-3].

The mortality rate varies with age, being the highest at the extremes of age. Many factors have been described as responsible for surgical morbidity and mortality of patients who underwent emergency abdominal surgery. These include age of the patient, increased time between the onset of symptoms and the hospital admission, the hospital admission and surgery, nature of operation, presence of peritonitis, a delayed diagnosis, management, complication detection time and postoperative stay[1-4,17].

Intestinal obstruction has been the leading cause of acute abdomen in several African countries whereas acute appendicitis is the most frequently cause in the developed world (3-7). The leading causes of intestinal obstruction in African countries are hernia and volvulus whereas adhesions are most frequent causes of intestinal obstruction in the developed world (7-13). There are, however, some studies in Africa which are pointing changing patterns of these established facts [14, 15]. Diagnosis of acute abdomen before laparotomy is essential

in reducing the morbidity and mortality.

Surgical acute abdomen is one of the commonly encountered emergencies in the practice of general surgery and for which emergency surgical operation commonly performed. The causes of preoperative death included perforated peptic ulcer (15.4%) and urgent colonic resection (9.4%) [16]. Emergency procedures generally are associated with increased morbidity and mortality rate in elderly patients (the overall mortality was 22%) [17].

The magnitude of non-traumatic surgical acute abdomen is different in deferent areas due to socioeconomic, demographic factors and diet habits. In addition to this, incidence of post-operative complication varies in different regions and setups. Although there is few study in the region, there is no study that assesses magnitude, causes, postoperative complication and final outcomes of patients who were managed operatively for the diagnosis of non-traumatic surgical acute abdomen in Wolaita Zone or Wolaita Sodo University Teaching and Referral Hospital (WSUTRH). Knowing the magnitude and common causes as well as presentations of non-traumatic acute abdomen has great advantage for early clinical diagnosis and its prompt measurement. Non-traumatic surgical acute abdomen is common and relatively non preventable emergency, but if diagnosed and managed early, postoperative complications and final outcome of death can be highly reduced.

METHODS

Study area and period

The study was conducted at Wolaita Sodo University Teaching and Referral Hospital (WSUTRH), Wolaita Sodo, Southern Ethiopia from September 18-30, 2015. Woliata Sodo Teaching and Referral Hospital is located 396 km to the South of Addis Ababa and 165km far from the Regional city, Hawasa, Southern Ethiopia. WSUTRH, formerly known as Sodo Zonal Hospital and it was established in 1920 E.C. It is serving as a teaching hospital and gives general service for more than 2 million population of the zone and nearby population from Dawuro, Gamogofa and Kambata Tembaro zones. The total number of beds in the Hospital is 200. Out of these 56 beds (Male ward 30 beds, Female ward 14 beds and Pediatrics ward 12 beds) are found in surgical ward. It has two major and one minor operation rooms. The total number of staff in the hospital is 412. Out of which 127 are health professionals including specialists, General practitioners, Health Officers, Nurses, Anesthetists, Laboratory Technologists, Lab Technicians, Radiologist and X-Ray Technicians. Surgical ward consists 3 Surgeons, 8 General practitioners and 24 Clinical nurses. Some of the services given by surgery department are outpatient services, in patient service, emergency services, and emergency and elective surgical operations at minor and major operation rooms.

Study design

Hospital based retrospective cross sectional study was conducted at WSUTRH, Wolaita Sodo, Southern Ethiopia. Data was retrieved from medical records of patients documented from July 1, 2013 to June 31, 2015.

Source population

All non-traumatic acute abdomen cases surgically treated at WSUTRH, from July 1, 2013 -June 31, 2015.

Study Population

All patients treated surgically with the diagnosis of non-traumatic surgical acute abdomen illness at WSUTRH, from July 1, 2013 -June 31, 2015.

Study Unit

Individual patient medical card in which patient's medical history registered for whom operation done for the diagnosis of non-traumatic surgical acute abdomen from July 1, 2013 to June 31, 2015.

Sample size determination

All 270 operated patients for non-traumatic surgical acute abdomen from July 1, 2013 to June 31, 2015 were taken as the sample size.

Sampling Technique

The study population was selected by using convenience of time technique from list of surgical operation registration book and the sample size was all patients (270) who operated for surgical acute abdomen during July 1, 2013 to June 31, 2015.

Inclusion and exclusion criteria

Inclusion criteria

All cases operated for the diagnosis of non-traumatic surgical acute abdomen during the study period.

Exclusion criteria

Patients those with diagnosis of non-traumatic surgical acute abdomen and who were operated out of WSUTRH and admitted after operation in the hospital. Patients those whose medical charts were incomplete and lost. Patients had diagnosis of gynecologic non traumatic acute abdomen also excluded in this study.

Data collection tools and techniques

The data for this study was collected using pre tested check list which had socio-demographic variables, patient's history and outcome of surgical non-traumatic acute abdomen cases treated operatively from their cards. The

check lists were prepared in English.

Two degree clinical nurses for data collection and one health officer for supervision were recruited from WSUTRH surgery staff. The Principal investigator gave two days training for data collectors on how to fill the prepared checklist, the importance of data quality and the relevance of the study. The health officer was supervising the daily activity on the consistency and completeness of the checklist. The Principal Investigator checked the daily activities of data collectors and supervisor.

Data was collected from patients admitted to surgical wards of WSUTRH with the diagnosis of non-traumatic surgical acute abdomen and treated operatively from July 1, 2013-June 31, 2015. Initially card numbers of the patients were identified and collected from admission log-books of surgical wards and operation theater of WSUTRH. Then cards of the patients were identified, collected from card room by data collectors and important information about patients with the diagnosis of non-traumatic surgical acute abdomen was collected. Finally documents from patient cards were entered in to a structured format by using trained data collectors.

Operational definitions

- **Acute abdomen-** is any sudden condition with chief manifestation of pain of recent onset in the abdominal area which may require urgent surgical intervention.
- **Appendicitis**—Inflammation of appendix.
- **Intussusceptions** ---Invagination of one part of bowel lumen in to the other.
- **Peritonitis** --- Inflammation of peritoneum.
- **Intestinal obstruction (IO)** - Intestinal obstruction is prevention of passage intestinal contents.
- **Clinical manifestation:** sign and symptom of intestinal obstruction, appendicitis, peritonitis, etc.
- **Laparotomy:** Incision through the abdominal wall
- **Intraoperative procedure:** The procedure that can be done after laparotomy was done which can be resection & anastomosis or colostomy or etc. depending on the causes& intraoperative finding of obstruction
- **Intraoperative finding:** The finding after abdomen is opened which can be gangrenous bowel or viable bowel and etc
- **Operative management:** means surgical exploration of the abdomen which is determined by the number of peritoneum.

Data quality management

Before data collection: The prepared checklists in English were commented by research advisors. The data collectors and Supervisor were trained for two days.

Pre- test: Before the actual data collection, checklists were tested on 5% of the total study population size before the study period at WSUTRH other than the study period. Then possible modification was made on the check lists using the findings of the pre-test.

During data collection: Regular daily supervision was done for checking the consistency and completeness of the filled out checklists by the principal investigator. The completed checklists were checked for their completeness and consistency at every step of data collection.

After data collection: Before starting data analysis completeness was rechecked again.

Data processing and analysis

The collected data was checked for its completeness, then coded and entered using SPSS version 20 computer program for analysis after edition. Descriptive statistical analyses were used. Finally; the data was described and presented using tables and charts.

Ethical considerations

The ethical issue of this study was approved by the research committee of Wolaita Sodo University, College of Health Sciences and Medicine and official permission was obtained from the College before commencement of the study. A formal letter was written from the medical director of the hospital. Card room workers and surgical staff were informed about the purpose of the study. The data was collected by review of the registration books using structured checklists. After completion of the data collection, medical records were returned properly to their original site.

RESULTS

Socio-demographic characteristics

Two year retrospective study conducted on non-traumatic surgical acute abdomen cases treated operatively at WSUTRH, Southern Ethiopia. During the study period, a total of 633 laparotomies were performed for both elective (210) and emergency (Traumatic (47) & Non-traumatic acute abdomen (376)) cases. A total of 376 laparotomies were on emergency non-traumatic acute abdomen,(59.4%) of all laparotomies. Out of 376 records, of which 270(71.8%) had adequate information for further analysis where retrieved. There were a total of 270 surgical emergency laparotomies for non-traumatic surgical acute abdomen. Two hundred seventy cases data retrieved from medical records made the basis of this study. There were 196 (72.6%) male and 74 (27.4%) female

cases (Table 1). The age ranged from 3 months to 65 years with a mean age of 26.51 years. Two hundred thirty eight (88.1%) patients were from rural and 32(11.9%) patients were urban dwellers. Patients presented within 2-5 days of illness were 63.3% (171), within 2 days of illness 26.7% (72) and more than 5 days of illness 10%(27) respectively . The main presenting features were: abdominal pain, vomiting, constipation and abdominal distention; and they were reported among 99.3% (268), 92.2% (249), 62.6% (169), 53.3% (144) of the study subjects (Fig.2). The three top causes of acute abdomen were bowel obstruction accounting 49.3% (133), followed by acute appendicitis 31.5% (85) and Peritonitis 19.3% (52) (Fig. 3).

Socio-demographic characteristics of patients with non-traumatic surgical acute abdominal cases at WSURTH from July1, 2013 –June 31, 2015

Socio-demographic Variables (n=270)	Frequency	Percent
Age		
≤14 years	50	18.5
15-24 years	140	51.9
25-34 years	50	18.5
35-44 years	23	8.5
≥55 years	7	2.6
Sex		
Male	196	72.6
Female	74	27.4
Residence		
Urban	32	11.9
Rural	238	88.1

Intestinal Obstructions

Small bowel Obstruction

Small bowel obstruction (SBO) was the leading cause of bowel obstruction which accounted 72.73% (98) of bowel obstructions; of which (39.8%) was primary small bowel volvulus, followed by intussusceptions (28.6%) (Table2). Out of the total SBO 71 (72.4%) cases were males and 27 (27.6%) were females with male to female ratio 2.6:1. Majority of SBO cases 95.9% (94) were from rural and the rest 4.1 % (4) were from urban. The common symptoms were abdominal pain and vomiting which were seen in 100% of SBO cases, constipation and distension each seen in 94.67% and 91.99% of patients respectively (Fig.2). Out of 39 primary small bowel volvulus obstructions , 76.9% (30) were males and 23.1% (9) were females and majority of cases were in 15-34 years age group. Fifty eight (59.2%) of SBO cases were found to be viable and 40(40.8%) were nonviable. Of 40 cases of nonviable SBO, 36(90%) and 4(10%) were managed by REEA and RESA respectively. Among the viable SBO cases, 43.1% (25) were primary small bowel volvulus obstruction and derotation was done (Table3).

The 2nd leading cause of SBO was intussusceptions of which 39.3% (11) were viable and the rest 60.7% (17) were nonviable cases for which reduction and REEA done respectively. From the total intussusceptions cases 18(64.3%) were males and 10 (35.7%) were females with male to female ratio 1.8:1. All (28) intussusceptions cases were ileo-colic and from rural. Wound infection (3), leak (2), collection (1) and Sepsis (1) were the main early post-operative complications in SBO. There were 4 (4.1%) deaths of which 3(3.1%) were from non-viable SBO and 1(1.0%) from viable SBO.

Table 2: The frequency of causes of SBO at WSUTRH, Southern Ethiopia from July1, 2013-June 31, 2015.

Causes of SBO(n=98)	No. of cases	% from SBO	% from total obstructions
Small bowel volvulus	39	39.8	29.3
Intussusceptions	28	28.6	21.1
Adhesion/band	20	20.4	15
Hernia	6	6.1	4.5
Others	5	5.1	3.8

Table 3: The frequency and procedure of SBO at WSUTRH, Southern Ethiopia from July1, 2013- June31, 2015

Types of procedure(n=98)	Frequency	% from total cases	% from total obstructions
REEA	37	13.7	37.8
Derotation and milking	23	8.5	23.5
Simple reduction and repair	14	5.2	14.3
Adehesionolysis	18	6.7	18.4
RESA	4	1.5	4.1
Biopsy only	2	.7	2.0

Large bowel obstruction

Sigmoid volvulus was the leading cause of LBO 24(68.6%) followed by ileosigmoid knotting 4(11.4%) and colo-colic intussusceptions and colorectal CA were similar 3(1.1%) (Table4). The main presenting symptoms were abdominal pain (97%), constipation (100%), distension (100%) and vomiting (85.7%) of patients (Fig.2). Among 35 cases of LBO, 85.7% (30) were males and 14.3% (5) were females with rural 42.3% (33) cases and urban 5.7% (2) cases and 71.43% (25) were non-viable and 28.57% (10) were viable. Four (11.43%) of the total nonviable LBO were managed by Hartman's colostomy. Colostomy and ileo-colic anastomosis was done for other 5(14.29%) cases. The viable LBO (8 cases) was managed by simple derotation and deflation while for 18 cases primary REEA was done. Wound infection 8.6 % (3) and pneumonia 2.9% (1) were post operation complications. There were 11.43% (4) deaths (Table8) and all were happened after colostomy (2 cases) and simple derotation (2 cases) and from rural.

Table 4: The frequency and causes of LBO at WSUTRH, Southern Ethiopia from July1, 2013 -June 31, 2015

Cause of LBO (n=35)	No. of cases	%from LBO	% from total obstruction
Sigmoid volvulus	24	68.6	18.8
Ileo-Sigmoid knotting	4	11.4	3.0
colo-colic intussusceptoin	3	8.6	2.3
Colorectal cancer	3	8.6	2.3
Others	1	2.9	0.8

Table5: Frequency and Procedure of LBO at WSUTRH, Southern Ethiopia from July1, 2013 to June31, 2015

Procedure of LBO (n=35)	Frequency	Percent
Hartman's colostomy	4	11.4
Colostomy and Iileo-colic anastomosis	5	14.3
Simple derotation	8	22.9
Primary REEA	18	51.4

Appendicitis

The second leading cause of non-traumatic surgical acute abdominal cases in this study was appendicitis which accounted 31.48% (85). Among these, 79% (67) were males and 21% (18) were females with male to female ratio 3.7: 1. There were 75.3% (64) urban cases and 24.7% (21) rural cases. Abdominal pain 100%(85), nausea 95.29%(81) and vomiting 84.7%(72) were the main complaints of appendicitis (Fig.2). Appendicitis was high in the age group of 15-34years 21.9% (59) and 35-44years 6.7% (18) from surgically treated non traumatic surgical acute abdomen and low in both extreme age groups.

Acute appendicitis accounted 60% (51) of appendicitis followed by Appendiceal abscess 32% (27) and perforated appendicitis 8% (7) from non-traumatic surgical acute abdominal cases. Appendiceal abscess and perforated appendicitis was high in appendicitis with the age groups 15-34years 24.7% (21) and 4.7% (4) respectively. The procedure and management outcome of appendicitis depend on the types of appendicitis (Table 6). Wound infection was the common post-operative complication of appendicitis 3.5% (3). There was no any death.

Table-6: Procedures for different form of appendicitis at WSUTRH, Southern Ethiopia from July1, 20013-June31, 20015.

Types of Appendicitis (n=85)	Appendectomy only	Appendectomy + Drainage	Drainage only	Appendectomy +Lavage	Total
Acute Appendicitis	47	0	0	4	51
Appendiceal Abscess	4	8	8	7	27
Perforated Appendicitis	0	2	0	5	7

Peritonitis

There were 19.3% (52) cases that developed peritonitis at the time of operation from different sources. Among these, 26.92% (14) cases were from perforated appendicitis, 25% (13) from typhoid perforation, 19.23%(10) were primary peritonitis, 15.38%(8) were gangrenous bowel obstructions and 13.46% (7) were from perforated PUD. Majority of cases of peritonitis were those who came late before operation (Table 7). The main presenting features of peritonitis were abdominal pain (100%), vomiting (96.2%), nausea (69.2%) and constipation (67.3%), (Fig.2). Among perforated appendicitis 7 were males and 7 were female, all were from rural. Majority of cases were in the age group of ≤14years. The procedures were appendectomy plus lavege and drainage and there was one death due to sepsis. All cases of typhoid perforation were from rural and in the age group of ≤14years. There were (8) male cases and (5) female cases. The male to female ratio was 1.6:1 and repair done for 11(84.6%) cases whereas REEA done for 2(15.4%). There was 1death from repair due to sepsis secondary to leak. Seven of 10 cases of primary peritonitis were from rural and there were 5cases in each sex.

The male to female ratio was 1:1. All were managed by lavage only. The most post operation complications were wound infection 7(13.7%), sepsis and leak each accounting 1(1.9%). The total deaths among patients who had peritonitis at time of operation were 3(5.8%) (Table 8).

Table 7: Duration of illness before operation done, patients who had peritonitis at time of operation at WSUTRH from July1, 2013- June31, 2015.

Duration of illness before operation(n=270)	Perforated appendicitis	Typhoid perforation	Primary peritonitis	Gangrenous LBO	Gangrenous SBO	Perforated PUD	Percent	Total Population
<2days	0	0	0	0	0	4	5.6%	72
(2-5)days	13	9	8	1	5	3	22.8%	171
>5days	1	4	2	1	1	0	33.3%	27

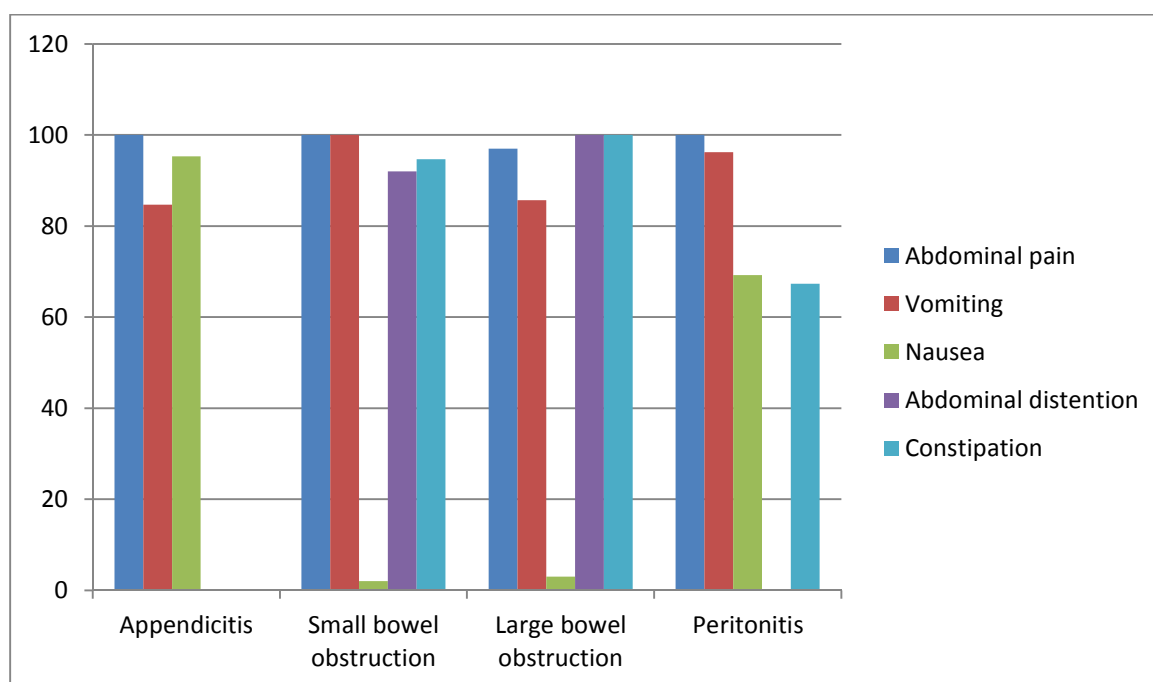


Fig.2 Summary of presenting symptoms of patients who were surgically treated for non-traumatic surgical acute abdomen cases at WSUTRH, Southern Ethiopia from July1, 2013-June31, 2015

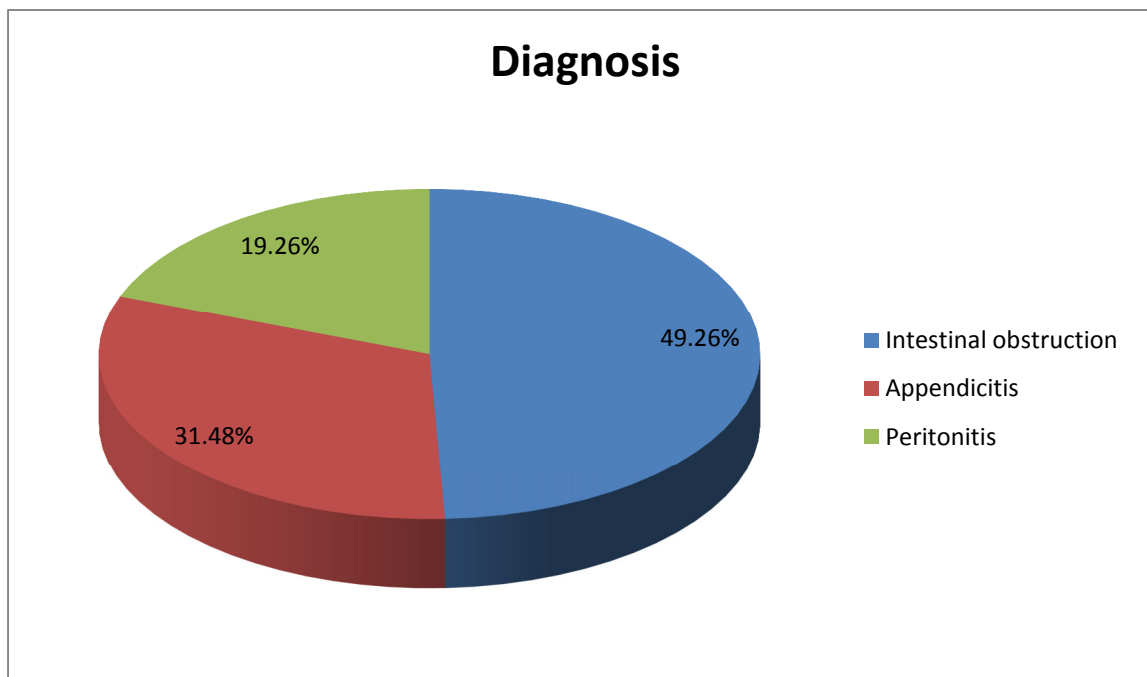


Figure 3: Frequency of the causes of emergency surgically treated non-traumatic surgical acute abdomen cases at WSUTRH during the year of July1 20013- June30, 20015 (n=270)

Table 8: Summary of patients condition on discharge after surgically treated for diagnosis of non-traumatic acute abdomen at WSUTRH from July1, 2013-June31, 2015

Causes of non-traumatic acute abdomen (n=270)	Frequency	Conditions on discharge		% of death from total study
		Improved	Dead	
Intestinal obstruction	133	125	8	2.96
Appendicitis	85	85	0	0
Peritonitis	52	49	3	1.1

DISCUSSION

There are very few studies done on the general pattern and specific causes of acute abdomen in Ethiopia [7, 8, 9, 13, 16, and 17]. This study included 270 non-traumatic surgical acute abdomen cases and of which, 196 (72.6%) were males and 74 (27.4%) were females. Out of the total study population 288 (88%) were rural resident. Majority of male patients, 40% (108) and 13% (35) were in the age group of 15-34 years and 35-44 years respectively, which was similar with previous studies done in Tikur Abessa Hospital (TAH) and other African countries [2, 3, 4, 6, 16, 17]. This may be due to the flatus theory that males pass their time in out-home duties that restricts them to pass flatus and feces for long time and loaded feeding habit per cycle of meal of males. But the opposite is true for females. Abdominal pain (99.66%), vomiting (95.25%), constipation (59.3%) and abdominal distension (56.89%) were the commonest symptoms in patients with acute abdomen. This is consistent with the finding from Gondar University Hospital [17].

Intestinal obstruction 49.3% (133) was found to be the leading cause of non-traumatic surgical acute abdomen for emergency operation, which is similar with the findings from studies conducted in Gondar University and Yirgalem Hospitals [13, 17]. This is in contradiction with the finding from studies done in Tikur Abessa Hospital, Zewudetu Memorial Hospital (ZMH) and Sina Hospital [2, 3, 4, 16, 18, and 20] where appendicitis is the leading cause of non-traumatic acute abdomen. This might be due to differences in diet and socio-economic condition.

Primary small bowel volvulus was the leading cause of SBO accounting 39.8% (39). This differs from the findings of studies conducted in TAH and Gondar University where adhesion is the leading cause of small bowel obstruction [16, 17]. Since adhesion is secondary (problem that occurs in patients who has history of previous surgery), this might be due to high operation rate in Tikur Abessa Hospital and Gondar University Hospital. Intussusception and adhesion were 2nd and 3rd causes of SBO. Out of 98 cases of SBO, 40 (40.8%) were non-viable and managed by resection and anastomosis. Majority (95.5% (127)) of cases with intestinal obstruction were from rural area. Among SBO cases 43.6% (58) were within the age range of 15-34 years. Male to female ratio is 3.2:1 which agrees with the study from Gondar University. This was commonly seen in patients who presented after 3 days of duration of illness that may lead to reduction in blood perfusion of bowel.

The leading cause of colonic obstruction 68.6% (24) was sigmoid volvulus which is similar with the finding from the study conducted in TAH (16)

In this study most of patients developed peritonitis at time of presentation and most of them resulted from perforated appendicitis 26.9%(14) followed by typhoid perforation 25%(13) primary peritonitis 19.2%(10), perforated PUD 13.5%(7), gangrenous SBO 11.5%(6) and gangrenous LBO 3.8%(2). Most 92.3% (48) cases were presented ≥ 2 days. But contrarily, study on Sina Hospital, showed that 14.4% of patients developed peritonitis, among which 5.7% resulted from PPUD, 3.5% of from perforated appendix [20]. This may be due to late presentation of patients because of different reasons like lack of health awareness, inaccessibility of health institutions where operation is not performed and no trained health staffs who did operations in rural areas. Similar to study in TAH, Peritonitis was highly seen in patient who came late ($> 52.34\%$ in 2 days) and from rural areas (83.18%) [16]. There were 12.22%(33) surgically treated non traumatic acute abdomen patients had one or more early postoperative complications which was lower than TAH study (28%). This may be due to good service of the WSUTRH after patients arrive at hospital.

The commonest early postoperative complications other than death were wound infection 5.9%(16), sepsis 3%(8) leak 1.9%(5) and pneumonia 0.7%(2) which is low when compared with study done in Gondar University Hospital i.e. wound infection (20.6%), sepsis (17.6%) and pneumonia (9.9%) but almost similar study in TAH (sepsis 25(12%), wound infection 9(9%) & pneumonia 6(3%)) except sepsis was lower in this study [16,17]. The overall mortality rate of emergency surgically treated acute abdomen was 4.1%(11) which is lower than study done in Gondar University Hospital (9.30%), Yirgalem (13.5%), Datubo (13.3%) and TAH (15.3%) [11, 12, 16, 17]. In this study the mean hospital stay of expired patients was 2.2 days and the mean age of the expired patients was 53.6 years. Most of the patients who died were operated for bowel obstruction. All of the patients dying with large bowel obstruction had gangrenous sigmoid volvulus. Almost all deaths were those patients who came after 2 -5 days of illness and all were from rural areas which was similar to TAH study [16]. In this study, the overall mortality rate were 0.4% for appendicitis, 0.4% of Typhoid, 1.48% of LBO and 1.48% of SBO perforation which was very low when compared with study done in TAH, Gondar University hospital and ZMH [13, 16, 17]. This may be due to good preoperative resuscitation and postoperative management of patients at WSUTRH.

Strength of the study

This study will have advantage by providing baseline information about non-traumatic surgical acute abdomen cases magnitude, causes, presenting clinical features and its management outcome to improve early diagnosis and interventions before complications occur. The result of this study will also add epidemiological and clinical information for planning makers to design proper strategies and also helps as reference for those who want to undertake researches in the study area.

LIMITATION

The limitation of this study was that being an institutional study, it might not be representative for Wolaita Sodo population. Since secondary data had been dealt, there were difficulties during data collection like tracing some medical records, incomplete and unorganized patients history on patients' medical card and unreadable hand writing.

CONCLUSION AND RECOMMENDATION

Conclusion

In this study we noticed emergency surgical operation for non-traumatic acute abdomen particularly for bowel obstruction was found to be the most common surgical emergency operations performed in WSTRH. Non traumatic acute abdomen was more common in rural dwellers and male sex. Most of patients experienced post-operative complications were those who came late and related with developing peritonitis.

Acute abdomen is a surgical condition with high rate of morbidity and mortality if not managed timely and appropriately. To alleviate this problem SNNP Regional Health Bureau, particularly Wolaita Sodo Zonal Health Bureau should create health awareness on acute abdomen to the general population in general and to all level of health care providers in particular has great importance. As most of the complicated cases with delayed presentation are from rural areas where health institutions with operation theatre and well trained health professionals are not well distributed, cases can be timely handled by properly trained MSc emergency surgeons by assigning them with fully equipped operation theatre and the reason for late presentation to the institution delivering the surgical treatment needs to be studied further. As well since mortality rate was different for different procedures for similar cases, SNNP Regional Health Bureau in collaboration with WSUTRH, should prepare common management protocol for all health workers.

Reference

1. Faiz. World Journal of Emergency Surgery Oct.31/ 2007 2:29 doi: 10.1186/1749-7922-2-29

2. Ayalew Tegegn. Cultural bowel patterns and sex differences in sigmoid volvulus morbidity in Ethiopian hospitals. *Trop Geogr. Med* 1995; 47 (5): 212-5
3. Gelfand M. The pattern of disease in Africa and the western way of life. *Trop Doc.* 2008; 6(4); 173-9
4. What is rambling appendicitis? (retrived 6 June 2011)
5. Krukwsitu Zh, Kelly TJ. Appendicitis, *Surgery* .2007; 15:76-81
6. Ogbonna BC, Obekpa PO, Momoh JT, Ige JT. Another look at acute appendicitis in tropical Africa and the value of laparoscopy in diagnosis. *Trop Doc.* 1993; 23: 824
7. M K Ali. Treatment of sigmoid volvulus: experience in Gondar, north-west Ethiopia. *World Journal of Emergency Surgery* 2010; 5:1 doi: 10.1186/1749-7922-5-1
8. P. Poovan MD FRCS, L Mohamed M D. Sigmoid volvulus management in a rural hospital in Ethiopia. *World Journal of Emergency Surgery* 2010; 5:1 doi: 10.1186/1749-7922-5-1
9. Motuma D. Small intestinal volvulus in Southern Ethiopia (Abstract), 3rd annual conference of the Surgical Society of Ethiopia November 26-27, 1998, Addis Ababa, Ethiopia
10. Lindtjorn B, Breivik K, Lende S. Intestinal volvulus in Sidamo, Southern Ethiopia. *East Afr Med J* 2009; 58: 208-11
11. Warambo MW. Acute volvulus of the small intestine. *East Afr. Med. J.* 2011; 48:209-11
12. Datubo-Brown DD, Adotey JM. Pattern of surgical acute abdomen ; University of Port Harcourt Teaching Hospital. *West Afr J Med* 2010; 9(1):59-62
13. Zelalem A. Pattern of acute abdomen in Yirgalem Hospital, Southern Ethiopia. *Ethiop Med J.* 2000; 38(4):227-235
14. Adesunkanmi AR. Changing pattern of acute intestinal obstruction in a Tropical African Population. *East Afr. Med. J.* 2006 Nov; 73 (11):727-31 29
15. Ajao OG. Abdominal emergencies in a tropical African population. *Br J Surg* 2008; 68(5):345-7
16. Kotiso B, Abdurrahman Z. Pattern of Acute Abdomen in Adult Patients in Tikur Anbessa Teaching Hospital, Addis Ababa, Ethiopia. *East and Central African Journal Surgery*, April 2007; 12(1) : 47-52.
17. Tsegaye S, Osman M, Bekele A. Surgically Treated Acute Abdomen at Gondar University Hospital, Ethiopia. Abstract from *East and Central African Journal of Surgery* 2006; 12(1) :53-57
18. Dencke A, Tadesse B. Incidence, patterns and clinical presentation of acute appendicitis in adults at (ZMH); *Ethiop J. of Health Science* July 2003; 13(2):122
19. Samuel et al. An Observational Study of the Etiology, clinical presentation and outcomes associated with peritonitis. *World Journal of Emergency Surgery* 2011
20. Laal, Marjan, Mardanloo .Acute abdomen; pre and post-Laparotomy diagnosis. Sina Hospital, Tehra, Iran, *International Journal of Collaborative Research on Internal Medicine & Public Health (IJCRIMPH)*, July 1, 2009; 2857