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Management oucome and Associated Factorsof Surgicallytreated Nontruamatic Acuteabdomen in Debre Markos Comprehensive Specialized Hospital, North West, Ethiopia

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COLLEGE OF MEDICINE AND HEALTH SCIENCES

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DEPARTMENT OF INTEGERATEDEMERGENCY SURGERY AND OBSTETRICS

TITLE: MANAGEMENT OUCOME AND ASSOCIATED FACTORSOF SURGICALLYTREATED NONTRUAMATIC ACUTEABDOMEN IN DEBRE MARKOS COMPREHENSIVE SPECIALIZED HOSPITAL, NORTH WEST, ETHIOPIA

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MANAGEMENT OUTCOME AND ASSOCIATED FACTORS OF SURGICALLY TREATED NON-TRAUMATIC ACUTE ABDOMEN IN DEBRE MARKOS COMPREHENSIVE SPECIALIZED HOSPITAL, NORTH WEST, ETHIOPIA

THESIS REPORTSUBMITTED TO BAHIR DAR UNIVERSITY COLLEGE OF MEDICINE AND HEALTH SCIENCES, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF INTEGRATED EMERGENCY SURGERY AND OBSTETRICS

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SEPTEMBER, 2021

 BAHIR DAR,ETHIOPIA

Declaration

This is to certify that the thesis entitled “Management outcome and associated factors of surgically treated non-traumatic acute abdomen in Deber Markos Comphernsive Specialized Hospital”, submitted in partial fulfillment of the requirements for Master of Integrated emergency surgery and obstetrics in Bahir Dar University, is a record of original work carried out by me and has never been submitted to this or any other institution to get any other degree or certificates. The assistance and help I received during the course of this investigation have been duly acknowledged.

Mahlet Adelew	September 2021	D/Markos
Name of the candidate	Date	Place

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Approval of Thesis for defense

I hereby certify that I have supervised, read, and evaluated this thesis titled "management outcome and associated factors of surgically treated non traumatic acute abdomen in Deber Markos Comprehensive Specialized Hospital" by Mahlet Adelew prepared under my guidance. I recommend the thesis be submitted for oral defense (mock-viva and viva voce).

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Approval of thesis for defense result

As members of the board of examiners, we examined this thesis entitled "Management outcome and associated factors of surgically treated non traumatic acute abdomen in Deber Markos Comprehensive Specialized Hospital" by Mahlet Adelew.We hereby certify that the thesis is accepted for fulfilling the requirements for the award of the degree of "Master of Integrated emergency surgery and obstetrics in Bahir Dar University"

Board of Examiners

External examiner name	Signature	Date
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Internal examiner name	Signature	Date
…….	……..	……
Chair person's name	Signature	Date
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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.The causes of non-traumatic surgical acute abdomen and their relative incidence vary in different populations.Most of patients experienced post-operative complications were those who came late, old age, delay diagnosis and related with developing peritonitis. There are only few studies on non-traumatic surgical acute abdomen in Ethiopia.**Objective:** To assess the management out come and associated factors of surgically treated non-traumatic acute abdomen. In Deber Markos Comprehensive Specialized Hospital, North West Ethiopia.**Methods:** A hospital based cross-sectional study design was conducted on surgically treated non-traumatic acute abdomen from September 1/2019G.C-August 30/2020 G.C and the data of sampled patient record was collected from medical records. Then it was coded, entered, cleaned and analysed using SPSS version 25. Data was analyzed and presented by using frequency distributions and logistic regression. On binary logistic regression analysis, a p-value < 0.25 was used as a reference to be a candidate for multivariate logistic regression analysis. P Value <0.05was considered as statically significant.

Results: In this study 275participants were included and finally analyzed. From these ,42(15.3%) patients have unfavorable outcomes. The most common postoperative complication occurred was surgical site infection (6.9%), sepsis (4.7%), leak (3.6%)and pneumonia(3.6%) among those 13(4.7%) postoperative deaths were also documented asunfavorable surgical management outcomes. Of the determinant factors analyzed in this study, only four factors, durationof illness before surgery, length of hospital stay after surgery, comorbidity, and hypotension were significantly associated withthe management outcome.**Conclusions:** In this study, the majority of patients had favorable surgical management outcomes, and the proportion of patients with unfavorable outcomes was however considerable. Thus, designing a strategy addressing the significantly associated determining factors could be helpful to further increase the likelihood of favorable surgical management outcomes of non-traumatic acute abdomen.

Keywords: Non-traumatic surgical acute abdomen, complications, outcome

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ACRONYMS

BSC	Bachelor of Science
MPH	Master of Public Health
DMCSH	Deber Markos Comprehensive Specialized Hospital
DRH	Debre Birhan Referral Hospital
GPs	General Practioners
Gyn and obs	Gynecology and Obstetrics
IESO	Integrated Emergency Obs/gny and Surgery
IO	Intestinal Obstruction
LBO	Large Bowel Obstruction
NGO	Non-Governmental Organization
NRH	Nekemte Referral Hospital
NTAA	Non traumatic acute abdomen
OR	Operation Room
PPUD	Perforated Peptic Ulcer Disease
SBO	Small Bowel Obstruction
SGH	Suhul General Hospital
SPSS	Statistical Package for the Social Sciences
TAH	Tikur Anbesa Hospital
UGCSH	University of Gondar Comprehensive Specialized Hospital
WSRH	Wolaita Sodo Teaching and Referral Hospital

CHAPTER ONE: INTRODUCTION

1.1 **Background**:Acute abdomen is an acute onset of abdominal disease entities that require immediate surgical intervention in most of the cases.Encompass a spectrum of surgical, medical and gynecological conditions, ranging from the trivial to life-threatening, which require hospital admission, investigation and treatment (1).

The acute abdomen accounts for up to 40% of all emergency-surgical hospital admissions and is considered in the differential inmore than 7 million visits to the emergency department annually for abdominal pain in the United States(2).some of which do not require surgical treatment, produce abdominal pain, so the evaluation of patients with abdominal pain must bemethodical and careful. The proper management of patients with acute abdominal pain requires a timely decision about the need for surgical operation.This decision requires evaluation of the patient's history and physical findings, laboratory data, and imaging tests(3).

The diagnoses associated with an acute abdomen vary according to age andgender.Appendicitis is more common in theyoung, whereas biliary disease, bowel obstruction, intestinal ischemia and infarction, and diverticulitis are more common in theelderly. Most of these diagnoses result from infection, obstruction,ischemia, or perforation(4-6).

Improvements in imaging techniques, especially multidetector CT scans and ultrasound have revolutionized the diagnosis of the acute abdomen. The most difficulty diagnostic dilemmas of the past, appendicitis in young women and ischemic bowel in the elderly, can now be diagnosed with much greater certainty and speed(7-9).

Acute appendicitis is the most frequently seen cause in the developed world whereas intestinal obstruction has been the leading cause of acute abdomen in severalAfrican countries (10-15). But now a dayfew studies have noted the shift in diagnosis from intestinal obstruction to appendicitis in African populations. This trend of lower rate of intestinal obstruction could likely be due to the Westernization (i.e. diets consisting of lower portions of fiber) in certain regions in Africa (16, 17).

Post-operative adhesion, tumor and groin hernias were found to be the commonest causes for intestinal obstruction in developed country. Volvulus is significance cause of primary bowel obstruction in sub-Saharan African country. Intestinal obstruction is the most common cause for non-traumatic acute abdominal admission accounting 50.7%. 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 ,old age, delay diagnosis and related with developing peritonitis (13, 18-20).

Non traumatic acute abdomen (NTAA) is a commonly encountered condition in accounting for 36.4% of the surgical emergency, the overall mortality rate of 15.3% and postoperative hospitalmortality rate of 14%. wound infection, sepsis and pneumonia are the most common post-operative complication and associated with long hospital stay(21).

1.2 Statement of the problem

Surgical acute abdomen is one of the commonly encountered emergencies in thepractice ofgeneral surgery and for which emergency surgical operation commonly performed and a challenge to any surgeon. Acute abdomen is a commonlyencountered condition accounting for 36.4% of the surgical emergency procedures done in the department(5, 10).

Non-traumatic surgical acute abdomen is a commonly encountered condition accounting high prevalence of all cases admitted in surgical ward. Most patients having acute abdomen arerelatively young in the 2^{nd} and 3^{rd} decades of life. The common cause of acute abdomen was acute appendicitis followed byintestinal obstructions and peritonitis. Peritonitis and large bowel obstruction were the commonest cause of patients to have bad outcome. The overall mortality rate of 5.4% (22-24).

Study done at India shows, mortality was highest in patients with gut perforation i.e., 32 patients, followed by intestinal obstruction in 21 patients, while 3 patients had burst hepatic abscess leading to peritonitis as cause of death. The overall mortality was 56 (9.59%) (25).

Study done at Nigerian Tertiary Hospital shows, late presentation accounted for the poor outcome in the patient with strangulated inguinoscrotal hernia and the patient with

gangrenous sigmoid volvulus. The common post-operative complication was wound infection and overall mortality was 6.5%(17).

Study done in Wolaita Sodo Teaching and Referral Hospital common complication after surgical management was wound infection, leak, collection and Sepsis. The overall mortality rate was 4% (13).

The total postoperative complication rate was 17% of which the commonest early postoperative complications were wound infection (5.4%), sepsis (4.3%) and pneumonia (2. 3%).About 90.1% were discharged well while 9.35% were passed away in the hospital (26).

Study done in nekemte referral hospital, Patient who was<14 years of age15.4 times more likely to had good management outcome as compared with other age group. Patient who came from rural area has 5 times higher bad management outcome as compared to patient who came from urban. Patient who had >2 days' duration of illness has 3.8 times higher more likely unfavorable outcome as compared to patient who came with <2 days of duration (22).

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 setup(13, 18, 20, 27)

Understanding the management outcome and its associated factor, common cause as well as common presentations of non- traumatic acute abdomen has great advantage for early clinically diagnosing and its prompt measurement.Early diagnosis and managementhighly decrease post op complication and death.Even if, a few studies conducted in some part of Ethiopian on NTAA especially in southern nation, factors attributable to the management outcome not well studiedand some of them are not recent. Although there is no study that assessess management out come and associated factors of patients who were managed operatively forthe diagnosis of non-traumatic surgical acute abdomen in DMCSH.Therefore, this study aimed at assessing this problem.

1.3 Significance of the study

Non traumatic Acute abdomen is one of non-preventable surgical emergency, that cause major mortality & morbidity if not managed early and appropriately.There is a serious lack of data in DMCSH concerningmanagement out come and associated factors of surgically treated non traumatic acute abdomen. Despite of modern surgery is being practiced the mortality rate following non-traumatic surgical acute abdomen is still high worldwide, so knowing causes, management outcome and associated factors of diseases will help to make diagnosis early, then starting treatment accordingly and this will decrease delays in management and related complications.

This study had significant advantage for health professionals and other concerned body in that it can add useful informationabout pattern, mortality and morbidity of non-traumatic acute abdomen.

The result of this study can also add epidemiological and clinical information that will serve as a base for other study.

CHAPTER TWO: LITERATURE REVIEW

2.1 Management outcome of surgically treated non-traumatic acuteabdomen

2.11 Globally

Prospective study done in 326 patients with NTAA from November 2016 to June 2018.The male to female ratio was 3.4:1. Abdominal pain was the main symptom seen in all the patients (326) followed by fever (312), nausea and vomiting (273) (299) respectively.Rebound tenderness was the most common clinical sign (273). The most common disease presented as acute abdomen was Acute appendicitis (160) accounting to 49% followed by peritonitis as the second most common disease (85) 26%, followed by Acute intestinal obstruction (57) 17.4%. Acute appendicitis and peritonitis most commonin patients with age less than 40 years, and acute intestinal obstruction where as in patients with an age more than 40 Years. Themost common surgical procedures done were laparoscopic/open appendectomy for acute appendicitis, exploratory laparotomy with Graham's omentoplasty for perforated PUD and ileostomy for intestinal obstruction.A total of 11 patients (3.3%)expired post operatively and 17 (5.2%) patients had major post-operative complications including lower respiratory tract infection followed by surgical site infection(28).

A total of 410 patients were included in thestudy from January 2014 to December 2015. The mean age was 32 years; 60% patients were male the onset of pain was sudden in 21% of patients whereas the pain was more than 3 days in duration in 79% of the patients. Most common cause of acute abdomen was acute appendicitis 25%, followed by acute intestinal obstruction accounting for about 14% of the cases, nephrolithiasis and calculus cholecystitis were responsible in 13% and 12% casesrespectively, pancreatitis in about 6% of the cases, acid peptic disease and perforated duodenal ulcer in 6% and 3% cases respectively, 59 (14.33%) patients developed complications of which metabolic acidosis and electrolyte disturbance were the two most common complications and mortality rate of 1.46% was noted (29).

A study done among 120 cases from January 2016 to January 2017,the most common age group was 31–40 years of age. The sex incidence was male 58.33% and female 41.66%. The most common symptom of acute abdomen was pain abdomen in 88% followed by

vomiting in 78% of cases. 45 (37.5%) were diagnosed to be acute appendicitis followed by hollow viscous perforation 30(25%) and acute intestinal obstruction 25 (16.66%) case.The mortality was 10, that is, 8.33%,it was high in hollow viscous perforation and acute intestinal obstruction accounting for 40% of all deaths (27).

Study conducted on 1353 patients of non-traumatic abdominal emergencies,217 (16%) were managed conservatively while 1136 (84%) were operated. 96.64% cases of acute appendicitis were operated and only 3.36% underwent conservative management. The rate of operative intervention in acute intestinal obstruction and acute cholecystitis was 89.09% and 85.71% respectively. 81.89% cases of hollow viscus perforation were operated while 18.11% were treated conservatively. Only 18.18% cases of liver abscess underwent operation while all patients of Meckel's n Diverticulitis were managed operatively. Highest incidence (47.84%) of mortality was found in hollow viscus perforation followed by small bowel obstruction (26.08%) acute pancreatitis (17.40%) while acute cholecystitis and acute large bowel obstruction contributed to 4.34% each. Overall mortality in these studies was 3.39% (30).

2.12 In Africa

A retrospective study done at St. Francis hospital from October 2017 to October 1, 2019 in 284 patients, male to female ratio of 1.9:1. Majority of the patients (53.5%) were from rural areas while 46.5% patients were from urban regions. The major cause of acute abdomen in this population was intestinal obstruction due to sigmoid volvulus 25% (71). Other causes were Perforated peptic ulcer diseases (PPUD) 23.9% (68), intestinal obstruction (IO) due to fecal impaction (7.04%) adhesion (5%), obstructed hernia, colonic tumor (2.8%), other causes were pelvic abscess (1.27%), cholecystitis (1.7%), pancreatitis (0.2%)a total of 228 (80.3%) patients were operated, of which 72.4% (165) underwent laparotomy, appendectomy 50 (21.93%), and herniorrhaphy 13 (5.7%). Out of postoperative survivors, 32 (11.27%) patients developed postoperative complications of which 16 (5.63%) got wound infection, anastomotic leakage 7 (2.5%), enterocutaneous fistulae 5 (1.76%), and wound dehiscence accounted 1.41% (4) of overall complications. On the other side the high mortality rate was among the patients with peritonitis of which out of 36 patients who died, 18 (6.34%) had peritonitis due to PPUD (11).

A prospective studydone at the University of Benin Teaching hospital between September 2009 and August 2010. There were 99 males and 87 females with male to female ratio of 1.1:1. The most common causeof surgical acute abdomen was acute appendicitis 86 (46.2%), acuteintestinal obstruction 41 (22%) secondary to bands and adhesions 17 (9.1%) followed byObstructed/strangulated hernia 13(7%) Colonic cancer (4.8%) Large intestinal volvulus (1.1%) are most commoncause of intestinal obstruction. Perforated peptic ulcer 26(14%) third common cause surgical acute abdomen in these studies. From all surgically treated 12 died giving a mortality rate of 6.5%. Five patients each died from perforated peptic ulcer while two died from complications of acute intestinal obstruction(17).

2.13 In Ethiopia

One-year retrospective study conducted on adult patients admitted inTikur Anbesa Hospital(TAH). A total of 276 patients were admitted with a diagnosis of acute abdomen of whom the records of 235 patients were retrieved which made the basis of the study. The male to female ratio was 2:1. The ages ranged from 14 years to 84. Acute appendicitis accounting for 52% of cases was the leading cause of acute abdomenfollowed by intestinal obstruction (26%) and perforated Peptic ulcer disease (PPUD) (9%). Adhesions were the most frequent cause of small intestinal obstruction and Sigmoid volvulus was the leading cause of colonic obstruction. There were 60(28%) cases that developed post-operative complications. Sepsis was the most frequently identified complication in 25 (12%) followed by wound infection in 19 (9%) and pneumonia in 6(3%). From all operated patient 36 died postoperatively accounting for an operative mortality rate 15.3%(10).

Study conducted in 166 patientsat Suhul General Hospital (SGH), 94(56.6%) were male and 72(43.4%), 65(39.2%) were urban dwellers and 101(60.8%) were rural dwellers. The commonest present compliant was abdominal pain followed by vomiting which accounts 88.8% and 8.4% respectively. The most common cause of acute abdomen was acute appendicitis 90(54.2%) found followed by generalized peritonitis 45(27.1%) and intestinal obstruction 31(18.7%). The majority of the cases in acute appendicitis were in 2nd and 3rd decades of life. About 65 (72.2%) cases were found to have non complicated

acute appendicitis for them simple appendectomy has been done. Fifteen (16.7%) cases were Appendiceal abscess for whom abscess drainage was done and Ten (11.1%) were perforated appendicitis with local peritonitis. Generalized peritonitis was the second most common cause of acute abdomen leading to emergency laparotomy 45(27.1%), of which 33(73.3%) was following perforated appendicitis, 9(20%) was following perforated peptic ulcer disease, 2(4.5%) were following primary peritonitis. Simple closure with omental patch was done for all. Four of the 45 generalized peritonitis were died which gives case fatality rate 8.9%.Adhesion (8/24) was the leading cause of SBO followed by primary small bowel volvulus(7/24), intussusception (5/24) and hernia (4/24). Sigmoid volvulus was the common cause LBO (6/7) Thrifty four (20.5%) of operated patient had early (in-hospital) post-operative complication. of this wound infection 21(12.7%) were the commonest post-operative complications followed by death which make the overall case fatality rate 7(4.2%), anastomotic leak 2(1.2%), pneumonia3(1.8%) and sepsis 1(0.6%) were the list of post-operative complication. More than half patient who died were presented late > 5days from their initial symptom(31).

During the nine-month study period, there were 423 total surgical admissions in Attat hospital surgical ward from these 171 were for surgically treated non traumatic acute abdomen. Male to female ratio of 1.7:1, The age ranged from 01 to 69 year and most patient from rural area. The three top causes of acute surgicalabdomen were acute appendicitis accounting 48% followed by bowel obstruction 28% and Peritonitis 24%%), mortality rate was 9.35% and postoperative complication rate of 17%. Almost 41% of patients who developed postoperative complication died. The most common causes of death was sepsis (62.5%) followed by anastomosis leak (25%) and 81.5% of deaths were in patients who arrived at the hospital after 48 hours of illness. Peritonitis was the most common diagnosis 8 (50%) of patients associated with mortality followed by intestinal obstruction 7 (43.75%) while acute appendicitis (simple + complicated) accounted 1 (6.25%) of post-operative mortality. 61% of death was in the age group >= 45 years that indicated high mortality in high extreme of age(26).

A study done in Debre Birhan Referral Hospital(DRH), the age of patients ranged from 2 months to 88 years,205(57.4%) were males. Abdominal pain 341(95.5%), abdominal

distension220(61.6%) and Nausea and vomiting 306(85.7%) are the three most frequent history findings. From study subjects 181 (50.7%) cases were intestinal obstruction. From the total cases of obstruction 72(39.8%) are small bowel obstruction and 109(60.2%) are large bowel obstruction with the remaining 141(39.5%), 15(4.2%), 11(3.1%),2(0.6%), 3(0.8%), 2(0.6%), 1(0.3%), and 1(0.3%) casewas due to acute appendicitis. cholecystitis, Perforated peptic ulcer disease(PPUD), Variable ilial perforation, Pelvic inflammatory Disease(PID), primary peritonitis, intra-abdominal abscess and pancreatitis respectively. From small bowel obstruction 57(79.2%) cases are simple and 15(20.8%) are gangrenous small bowel obstruction. From the large bowel obstruction cases 97(89%) are simple and 12(11%) are gangrenous. The overall success rate of treatment of acute intestinal obstruction is 98.3% with 181 and 3(1.6%) of cases died(18).

2.2Factors associated with the management out come

2.21 Socio demographic factors

Patients with the age of ≥55 years were nearly 3 times more likely to develop poor outcomes as compared with patients whose age was ≤55 years(32). A study conducted in nekemte referral hospital show Patient who was <14 years of age were 15.4 times more likely to have good management outcome as compared with other age group and also another study show that age group less than 24 years had six times more likely to be improved compared to patients who are in the age group greater than 55 years (22, 26).

Being male sex are 3 times more likely to develop intestinal obstruction than females(18). And other study shows that being female 2 times more likely to result unfavorable outcome than male (33).

Patient who came from rural area 5 times higher to have bad management outcome as compared to patient who came from urban(22).

2.22 Disease related factors

Patient who had >2 days duration of illness has 3.8 times higher more likely unfavorable outcome as compared to patient who came with <2 days of duration, in similar condition other study shows that patients who came late (≥24 hours) were about three times more likely to develop poor outcomes compared with patients who came early (<24hours)(22,

32). Those who were presented less than 48 hours of illness before operation had 5.7 times more likely to be improved compared to those presented after 48 hours (26).

The mortality was very high (25%) in those with late presentation as compared to those who came relatively early taking two as a cutoff point (10).The patients presenting with a comorbid disease are ninety- five percent less likely to have a favorable outcome on the surgical management of IO when compared to those without any comorbid disease (34).

Those patients with gangrenous LBO and gangrenous SBO had, respectively, 3.6 and 4.2 times higher developing unfavorable outcome than patients with simple IO (32).

Patient who had large bowel obstruction has 10.2 times higher more likely bad management outcome as compared to patients with other than large bowel obstruction and Patient who had peritonitis has 10.7 times higher more likely Un favorable management outcomeas compared to patients other than peritonitis(23).

2.23 Treatment related factors

Patients who stayed in hospital for less than 5 days are less likely to develop unfavorable outcome as compared with patients stayed for greater than 5 days , similarly in other study patients who stayed for less than and equal to 5 days had 92.3 times less likely to have un favorable outcome as compared with patients stayed for greater than 5 days (22, 23).

The patients those who stayed in the hospital for ≤8 days after surgery were about three time more likely to have favorable outcome than those who stayed in the hospital for >8 days after surgery (34).Patents who did not developed postoperative complications were 5.6 times more likely to be improved compared to who had complications (26).

2.3 Conceptual framework

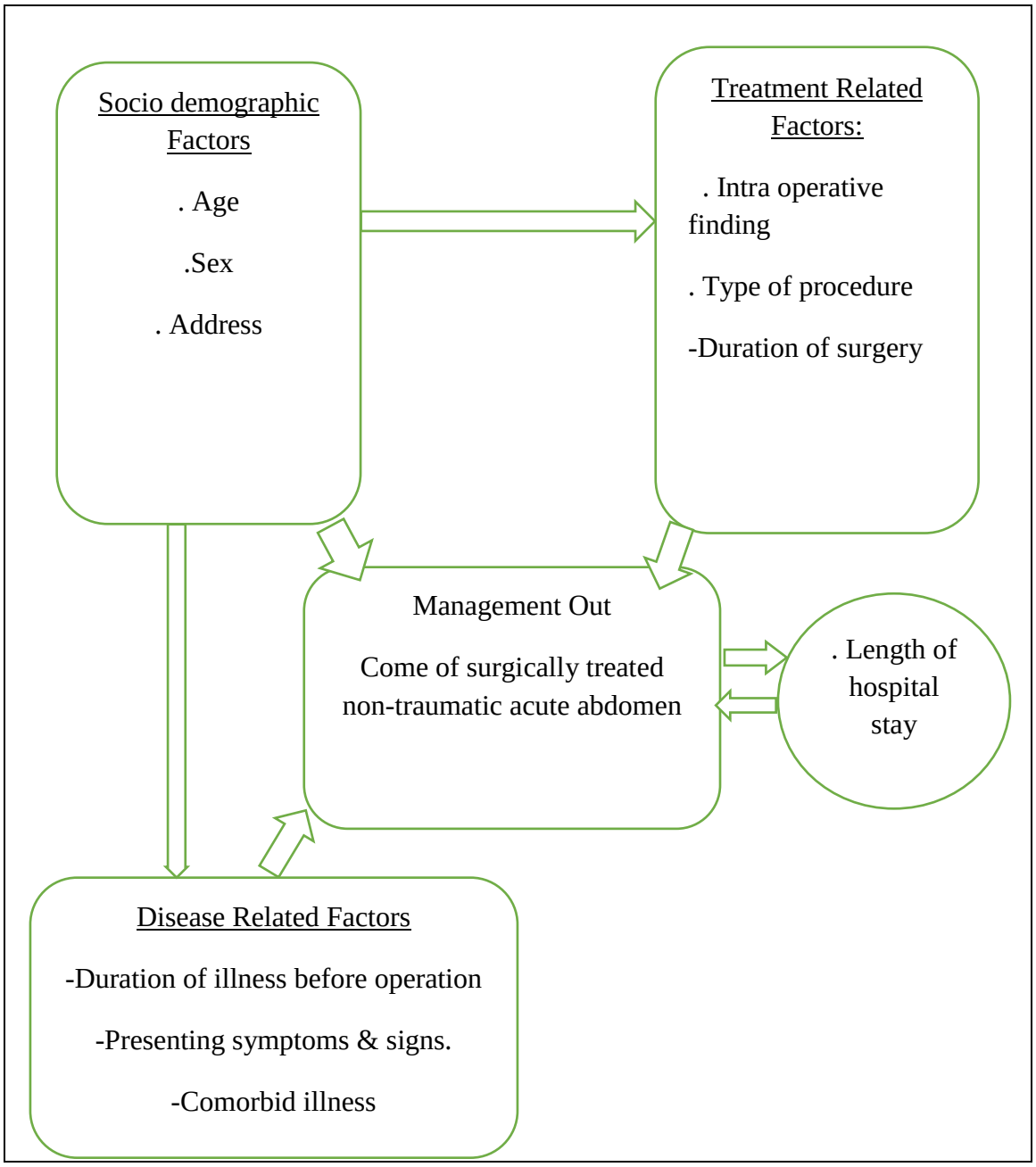

Figure 1:Conceptual framework on management outcome of non-traumatic acute abdomen(18, 23, 26).

CHAPTER THREE: OBJECTIVES

3.1 General objectives

To assess the management outcome and associated factors of surgically treated non-traumatic acute abdomen in DMCSH,North West, Ethiopia from September 1/2019 G.C-August 30/2020 G.C.

3.2 Specific objectives

1. To describe management outcome of surgically treated non-traumatic acute abdomen.

2.To identify factors associated with management outcome of surgically treated non-traumatic acute abdomen.

CHAPTER FOUR: METHODS

4.1 study area and period:

The study was conducted in Debre Markos Comprehensive Specialized Hospital. The hospital is located in DebreMarkos town, the capital of East Gojjam Zone Administrative which is 299kms away in the North West Addis Ababa, the capital city of Ethiopia. 265kms to the capital of Amhara Nation Regional state, Bahir Dar. Currently the hospital had been providing full heath care service for the population of East Gojjam Zone and surrounding estimated to be about 3.500000 people.

DMCSH was established in 1965, surgery department has nine general surgeons, two orthopedic surgeons, twenty-three general Practioners andfifty-fiveclinical nurses. There are 35 beds in surgical orthopedic ward and thirteen beds in adult emergency surgical and medical OPD. The hospital has one operation room in which there are three major operation tables with full equipment and share the same operation table with gynecology/obstetric and orthopedics department (Source: HMIS department of the Hospital).This study wasconductedfromSeptember 1/2019G.C-August 30/2020G.C.

4.2 study design

Hospital basedcross-sectional study design in DMCSH.

4.3 source population

Sources of the study were all patients for whom emergency surgical operation has been performed forthe diagnosis of non-traumatic acute abdomen in DMCSH.

4.4 study population

All patients for whom emergency surgery was done for the diagnosis of non- traumatic acute abdomen in target available periodfrom September 1/2019G.C-August 30/2020G.C.

4.6 Eligibility criteria

4.6.1Inclusion criteria

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

4.6.2 Exclusion criteria

Gynaecological acute abdomen.

4.7 Sample size

Sample size calculation by using the single and double population proportion formula.

$$n = \frac{(z_{\alpha/2})^2 \cdot pq}{d^2}$$

Where, n= sample size

z=standard normal variance 95% confidence.

P= 20.5 % (Take from a study done at Suhul General Hospital on causes and outcome of surgically treated non- traumatic surgical acute abdomen) (31).

d= level of precision (5% degree of error).

$n = \frac{(1.96)^2.0.205\ (1-0.205)}{(0.05)^2}$

= 250

Considering 10% as incomplete chartsample size became 275

Table 1Sample size for second objective by using EPI info seven computer software.

	Assumption							
Variables	Ratio	Power	CI	P1	P2	Calculated OR	Sample Size	Referei
Age	1:1	80%	95%	9.7%	48%	0.116	52	(26)
Sex	1:1	80%	95%	58%	37.5%	2.3	204	(18)
Address	1:1	80%	95%	87%	27%	18	26	(18)
Duration of illness before operation	1:1	80%	95%	8%	28%	0.22	134	(26)
Length of hospital Stay	1:1	80%	95%	65%	21.4%	6.82	48	(23)

Key; ratio=unexposed: exposed, p1=%of outcome in exposed and p2=% of outcome in unexposed

Finally; the largest sample size calculated by a single population proportion formula was used.

4.8Sampling technique

Medical record numbers were sorted from smallest to large stand coded from 1-810. Required sample size was obtained by using simple random sampling technique. Selected charts were collected from the card room and presence of required information was checked and three lost charts were replaced with three other charts from previously not selected charts by lottery method.

4.9 Variables

4.9. 1. Dependent variables

Management outcome of non-traumatic surgical acute abdomen (favorable and un favorable outcome)

4.9.2. Independent variable

- Age

- Sex

-Place of residence

- Type of post-operative diagnosis

-Type of procedure

-Duration of illness before operation

-Clinical features

-Length of hospital stay

-Duration of surgery

- Comorbid illness

4.10 Operational definition

Acute abdomen - The term acute abdomenrefers to signs and symptoms of abdominal pain and tenderness, a clinical presentation occurs within seven days that often requires emergency surgical therapy(23).

Non traumatic acute abdomen - acute abdomen which is not secondary to trauma(23).

Surgical acute abdomen - acute abdomen secondary to surgical cases(23).

Appendicitis - Inflammation of appendix(16).

Appendectomy - Removal of appendix(16).

Cholecystitis - Inflammation of gallbladder(26).

Colostomy - Connecting the colon to the abdominal wall for stool drainage(18).

Comorbid illness –is the presence of one or more additional disease often co-occurring with the primary illness(35).

Intussusceptions - Invagination of one part of bowel lumen in to the other(23).

Hernia-is an abnormal protrusion of the whole or a part of viscus through an opening in the wall of the cavity.

Herniorrhaphy- is a procedure which involves legating the neck of hernia followed by cutting the sac (Herniotomy) and repair of the defect through which the sac has protruded(23).

Diverticulitis – inflammation of the diverticula(26).

Duration of illness before operation-The time interval between initiation of the illness and operation.

Length of hospital Stay-Number of days elapsed while the patient is in hospital.

Laparotomy - Incision through the abdominal wall.

Peritonitis - Inflammation of peritoneum.

Clinical manifestation - sign and symptom of the case.

Anastomosis - the surgical union of two hollow organs, e.g., parts of the intestine, to ensure continuity of the passageway and anastomosis leak refers to leakage through surgical union site(34).

Intraoperative procedure - The procedure that can be done after laparotomy, which can be resection & anastomosis or colostomy or etc. depending on the causes& intraoperative finding.

Intestinal obstruction (IO) - Intestinal obstruction is prevention of passage intestinal contents(34).

Wound dehiscence - is facial disruption due to abdominal wall tension overcoming tissue or suture strength, or knot security(34).

Intraoperative finding - The finding after abdomen is opened which can be gangrenous bowel or viable bowel etc(23).

Non operative management (conservative) - means managing a patient with a diagnosis acute abdomen without surgical intervention.

Operative management- means surgical exploration of the abdomen.

Favorable outcome – -Patents with a clinical diagnosis and operatively managed for NTAA then improved and discharged from the hospitalwithout any post-operative complication(34).

Unfavorable outcome –if the patient is dies or has one or more postoperative (after surgery for NTAA) complications like leak, sepsis, intra-abdominal collection, surgical site infection and pneumonia as documented in the medical records(34).

4.11Data collection toolsand techniques

Data wascollected byusing structure checklist/Compilation sheet to retrieve it from available sources (registered books, patient cards). Data collectors were selected from DebreMarkos University fourth year public health officer students and BSC nurses from DMCSH staffs.

Patients admitted to surgical ward of DMCSH with the diagnosis of non-traumatic acute abdomen and treat operatively from September 1, 2019G.C- August 3O,2020 G.C are initiallyidentified from operation log-books of operation room of DMCSH from which card number of patients were obtained. Then cards of the patients were identified, collected from card room and used to collect important information about patients admit with the diagnosis of non-traumatic acute abdomen.

4.12 Data quality management

Before data collection, the prepare checklist in English wasassessed andcommented by research advisors. The data collectors and Supervisor were trained for two days. During data collection in order to avoid the interpersonal variation between data collectors, data was collected by the same data collectors throughout the data collection. Regular daily supervision was done for checking the consistency and completeness of checklist by the principal investigator. Daily data entry and cleaning was done by the principal investigator. The issue of confidentiality and privacy wasstressed in much depth during the training session.

4.13 Data processing, analysis, interpretation

After data collection, it was coded, entered and cleaned using EPI data computer software and transfer to SPSS windows version 25and analyzed by using descriptive statistics like Percentages, mean and SD for data analysis. Data waspresented by frequency tables and figures. Association between dependent and independent variables waschecked by using binary and multivariate logistic regression.On binary logistic regression a p-value < 0.25 was used as a candidate for multivariate logistic regression analysis. Statistically significant association is testat a P-value of < 0.05. After data collection before starting data analysis completeness was rechecked again.

4.14 Ethical consideration

Ethical clearance wasobtained from Institutional Review Board of Bahir Dar University College of Medical and HealthScience (COMHS). A formal letter waswritten from thecoordinator of Integrated Emergency surgery and Obstetricsto the hospitaladministrator office. The Hospital medical directorwaspermitted us to conduct the study. The result of the study willbe given to the Hospital with proper recommendation on gaps identify.

4.15 Dissemination of Result

After complete the result of the study willpresented andsubmitted to Bahir Dar university college of medicine and health science as part of IEOS thesis. In addition to this the result will disseminated toAmhara Regional health bureau, East gojjam zone health offices, DMCSH to the targeted health facility and to NGOs working on this area. Furtherattempt will be made to publish it on national and international scientific journal.

CAPTER 5: RESULT

5.1 Sociodemographic characteristics and preoperative clinical feature

Two-year retrospective study was conducted on non-traumatic surgical acute abdomen cases treated operatively at DMCSH, North west Ethiopia. During the study period, a total of 275 patients were included in the study. There were 197(71.6%) males with male to female ratio of 2.7:1 respectively.The age ranged from 4 month to 83 years with a median age of 30 years and189(68.7%) patents were rural dwellers.Regarding the duration of illness, 157 (57.1%) cases are presented within 48 hours after the onset of symptoms. The duration however ranges from 6 hour to 14 days with median of 2 days. Abdominal pain (100%), vomiting (87.6%), abdominal distension (44.7%) and constipation(37.1%) were the main presenting symptoms whereas abdominal tenderness, distension and guarding with rigidity were the most frequent clinical signs found (85%, 40.3% and 39.6% respectively).28.3% of patients were in shock (BP < 90/60 mmHg),48.4% of patents were tachycardic (Pulse rate > 100 bpm and 49.8% of patents were tachypneic , 40% of patients were febrile (temp > 37.5 c) and 6.5%of patient has comorbid illness (Table 2).

Table 2: Sociodemographic characteristics and clinical features in patients with surgically treated non-traumatic acute abdomen in DMCSH, from September 1, 2019G.C- August 3O,2020 G.C.

Variable	Category	Frequency	Percent (%)
Age	<=24	99	36
	25-54	128	46.5
	>=55	48	17.5
Sex	Male	197	71.6
	Female	78	28.4
Address	Urban	86	31.3

	Rural	189	68.7
Symptoms			
Nausea	Yes	192	69.8
	No	83	30.2
Abdominal pain	Yes	275	100
	No	0	0
Vomiting	Yes	241	87.6
	No	34	12.4
Abdominal distention	Yes	123	44.7
	No	152	55.3
Constipation	Yes	102	37.1
	No	173	62.9
Pervious abdominal surgery	Yes	26	9.5
	No	249	90.5
Fever	Yes	109	39.6
	No	166	60.4
Comorbid illness	Yes	18	6.5
	No	257	93.5
Sign			
Abdominal distention	Yes	111	30.4

	No	164	59.6
Abdominal tenderness	Yes	234	85.1
	No	41	14.9
Guarding and rigidity	Yes	109	39.6
	No	166	60.4
Other finding	Yes	6	2.2
	No	269	97.8
Bowel sound	Normal	149	54.2
	Abnormal	126	45.8
Vital sign			
Blood pressure	Normal range	197	71.6
	Hypotensive	78	28.4
Respiratory rate	Normal range	138	50.2
	Tachypneic	137	49.8
Pulse rate	Normal range	142	51.6
	Tachycardic	133	48.4
Temperature	Normal range	165	60
	Febrile	110	40
Duration of illness	<48 hour	157	57.1
	>=48 hour	118	42.9

Duration of surgery	<2 hour	250	90.9
	>=2 hour	25	9.1
Length of hospital stay	<=5 day	182	66.2
	>5 day	93	33.8

5.2 Intra-operative and Postoperative Clinical Characteristics

The three top causes of acute surgical abdomen were acute appendicitis accounting 119(43.3%) followed by intestinal obstruction 94 (34.2%) and Peritonitis 62 (22.5%) (figure 2). About 241(87.6%) cases take less than two hours to complete the surgery, range from 30 mint to 3 hours with median of 1 hour. Length of hospital stay range from one day to 43dayswith median offour days(table2).

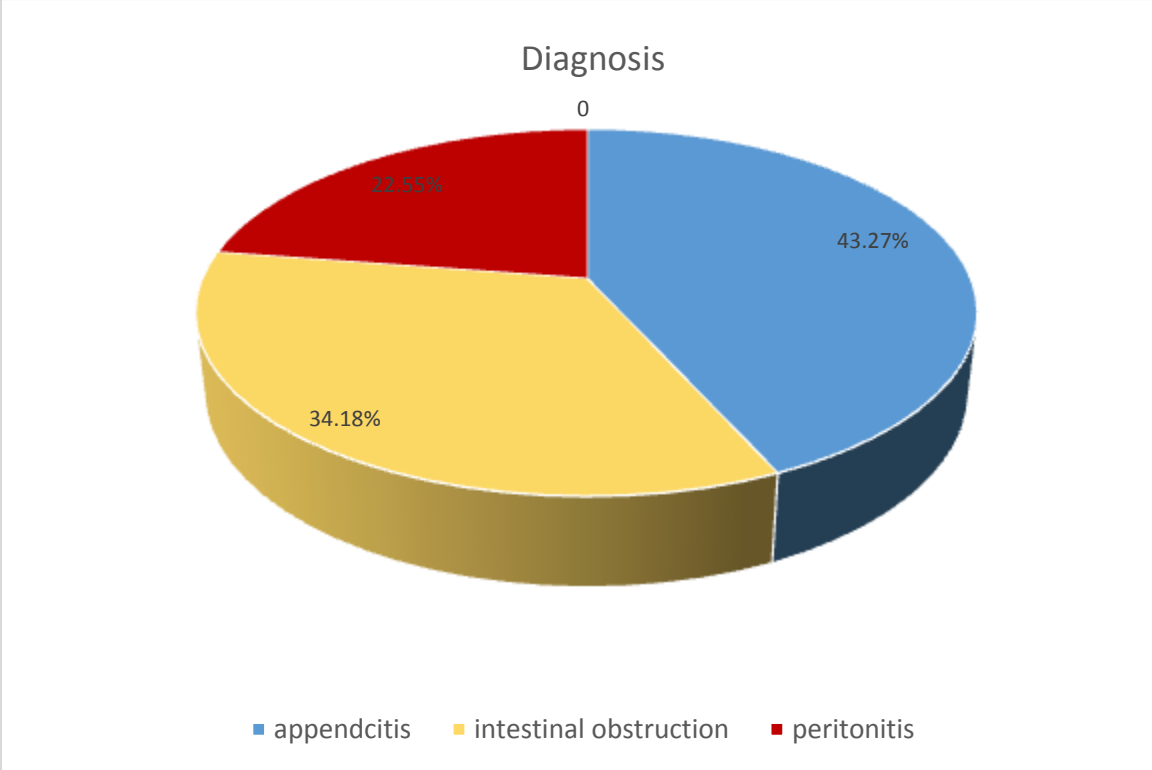

Figure 2**:** Type of surgically treated non-traumatic acute abdomen in DMCSH from September 1, 2019G.C- August 3O,2020 G.C.

Appendicitis

Appendicitis is the leading causes of acute abdomen, among 119(43.3%) cases of appendicitis 63% were males with male to female ratio of 1.7:1 and 67 (56.3%) of patients were come from urban. Appendicitis was high in prevalence in 2nd and 3rd decades which is 20 (17%) ,43 (36%) respectively and low in bothextreme age groups. Abdominal pain 119(100%), vomiting 104(87.3%) and nausea 92(77.3%) werethe main complaints of appendicitis. 60(50.42%) patients had a body temperature of >=37.5c. Acute appendicitis (simple) contributes 81(68.1%) and high in 2nd decade,perforated appendicitis accounts 32(26.9%) and six appendiceal mass (table 3).Surgically managed acute appendicitis of which 103(86.55%) were appendectomy followed by appendectomy with abscess drainage 14(11.8%),two cases managed by right hemicolectomy because of iatrogenic cecal perforation and other were managed by abscess drainage plus lavage (table 4). Six patients developed postoperative complications, surgical site infection was the leading cause 5 (4.2%) followed by, one sepsis, one pneumonia and one death after ileostomy due to anastomosis leak following right hemicolectomy after 30 days of admission. The complication was within $5^{th}$and 6^{th}decadesand who comes after two days ofillness.

Obstructions

The second common cause of non-traumatic surgical acute abdomen in patents operated at DMCSH was intestinal obstruction 94(34.2%). 49 (52.12%) of obstruction occupied by those age greater than 40years. Males were 76(80.8%) and male to female ratio was 4.2:1. Most of the patents were from rural area 86 (91.5%).

Small bowel obstruction

The leading cause of intestinal obstruction were small bowel obstruction 51 (54.2%).82.3% were male and 92.1% from rural area. Primary volvulus was the leading cause of small bowel obstruction 21(41.1%) followed by adhesion/band were 15(29.4%) all of them had history of abdominopelvic operation and eight hernias, five intussusceptions and one ileal stricture contributed27.4% (table3). Abdominal pain (100%), vomiting (88%), abdominal distension (82.3%) andconstipation (72.5%) were

the common presentations. 20% of patents were in hypotension, tachycardic (45%), tachypnea (58.8%) whereas 7.8% were febrile to>= 37.5 c. Abdominal distensionwas the commonest physical finding (80.4%) followed by tenderness (62.7%). 58.8% of them comes within 48 hour of illness and 41.2% >= 48 hour. From all small bowel obstruction 10 were nonviable and 41 were viable. The comments type of surgical procedure laparotomy plus Derotation and decompression were39%, laparotomy plus resection and anastomosis were 29%, nineadhesion and band release,six herniorrhaphy and one manual reduction was done for intussusceptions (table4). Duration of surgery were less than 2hours 41 cases and 10 case more than 2 hours. Mean duration of hospital stay was5. 3days.Therewere sixpatientsdevelop post-operative complication from which two anastomotic leaks, three sepsis, two wound infection, three pneumonia and one intra-abdominal collection. There were three deaths after relaparotomy and ileostomysecondaryto anastomotic leak and one patient left against medical advice after herniorrhaphy and anastomosis was done then he became critical secondary toanastomotic leak.

Table 3: Frequency of cause of appendicitis, intestinal obstruction and peritonitis managed surgically in DMCSH from September 1, 2019G.C- August 3O,2020 G.C.

Diagnosis	Frequency	Percent (%)
	Appendicitis	
Acute appendicitis	81	66.1
Perforated appendicitis/abscess	32	26.9
Appendiceal mass	6	5
	Small bowel obstruction	
Primary volvulus	21	41.2
Adhesion and band	16	31.4

Hernia	8	15.7
Intussusception	5	9.8
Others	1	2
Large bowel obstruction		
Sigmoid volvulus	31	72.1
Colorectal cancer	3	7
Ileosigmoid knotting	4	9.3
Intussusceptions	3	7
Others	2	4.7
	Peritonitis	
Perforated appendicitis	23	37.1
Perforated pud	15	24.2
Gangrenous SBO	12	19.4
Gangrenous LBO	9	14.5
Others	3	4.8

Large bowel obstruction

Large bowel obstruction contributes 43 (45.7%) from total bowel obstruction. The leading causes of large bowel obstruction were sigmoid volvulus 31(72%), ileosigmoid knotting4 (9.3%) and there werethree colorectalcancer, three intussusceptions, one cecal mass and one cecal volvulus (table3). Males were 79% with male to female ratio of 3.7:1. 21(49%) patients were above 50 year and most of the patents were from rural (91%). The four main complaints were abdominal pain (100%), abdominal distension (98%),

constipation (91%) and vomiting (74%).21% of patents were in hypotension (BP <90/60 mmHg), 33% tachycardia,53% tachypnea and 9.3 % were febrile (To >= 37.5c). Abdominal distension was the commonest physical finding (86%) next tenderness (53%) ,91% of patient has abnormal bowel sound. The mean duration of illness was 2.55days.16(37%) case are non-viable and 27(63%) are viable. The majority of cases managed by primary resection and anastomosis 35(81%). Four of the total non-viable LBO were managed by Hartman′s colostomy. Colostomy and ilieo-colic anastomosis were done for other 2 cases.Manual reduction done for two viable intussusception cases (table4). Mean hospital stay after management was 6.7day. There were ten complications (two wound site infections, three anastomosis leaks, two pneumonia two sepsis and one intra-abdominal collection). From all LBO patients one referral for chemotherapy and three were died giving mortality rates of 6.9%.

Table 4**:** Frequency of Procedures related to acute appendicitis, intestinal obstruction and peritonitis at DMCSH north west Ethiopia from September 1, 2019G.C- August 3O,2020 G.C.

	Frequency	Percent
Procedure of appendicitis (n=119)		
Appendectomy	103	86.5
Appendectomyplus abscess drainage	14	11.8
Right hemicolectomy	2	1.68
Procedure of LBO(n=43)		
Primary REEA	35	81
Hartman’s colostomy	4	9.3
Colostomy and Ilieo-colic anastomosis	2	4.6
Manual reduction	2	4.6

Procedure of SBO (n=51)		
Derotation and decompression	20	39
resection and anastomosis	15	29
adhesion and band release	9	18
Herniorrhaphy	6	12
Manual reduction	1	1.9
Procedure of peritonitis (n =62		
Resection and anastomosis	20	32
Appendectomy	17	27.4
Graham's patch	15	24
Appendectomy plus Abscess drainage	5	8
Hartman colostomy	4	6.4
Lavage plus drain tube	1	1.6

Peritonitis

Peritonitis was the 3rd common cause of non-traumatic surgical acute abdomen which accounts 62(22.5%). Perforated appendicitis was the leading cause of peritonitis 23 (37%) followed byperforated pud 15(24.2%), gangrenous SBO 12 (19.4%),gangrenous large bowel 9 (14.5%), one pancreatitis, one perforated small bowel tumor and one distal ileal perforation (table 3). Males were 46 (74%) with ratio of 2.9:1 and 51(82%) were rural. Abdominal pain was thecommon symptom (100%) then vomiting (95%) and on examination 100% of them have abdominal tenderness and 82% guarding with rigidity. 25 (40%) were in hypotension state,60% were tachycardic,53% were tachypnea and68% were febrile. Majority of cases (63%) of cases were those who came after 48 hours of illness before management. All are managed surgically, 17 appendectomies and lavage,5 appendectomy with abscess drainage, 15 grahams patch,20 resection and end to end anastomosis, fourHartman colostomies and one laparotomy plus drainage tube were done (table 4). Mean length of hospital stays was 7.2 day. There were twenty patients who develop postoperative complications of which the nine were wound infection, eight were sepsis, six intra-abdominal collection, four anastomotic leak, four pneumonia and one ARDS. From all complicated patient there were sixdeaths(four due to sepsis after relaparotomy, one due to ARDS and one intraoperative death due to sudden cardiac arrest). Two patients left against medical advice after their condition became complicated. Death rate following peritonitis from total surgically treated non-traumatic acute abdomen was 2.2%.

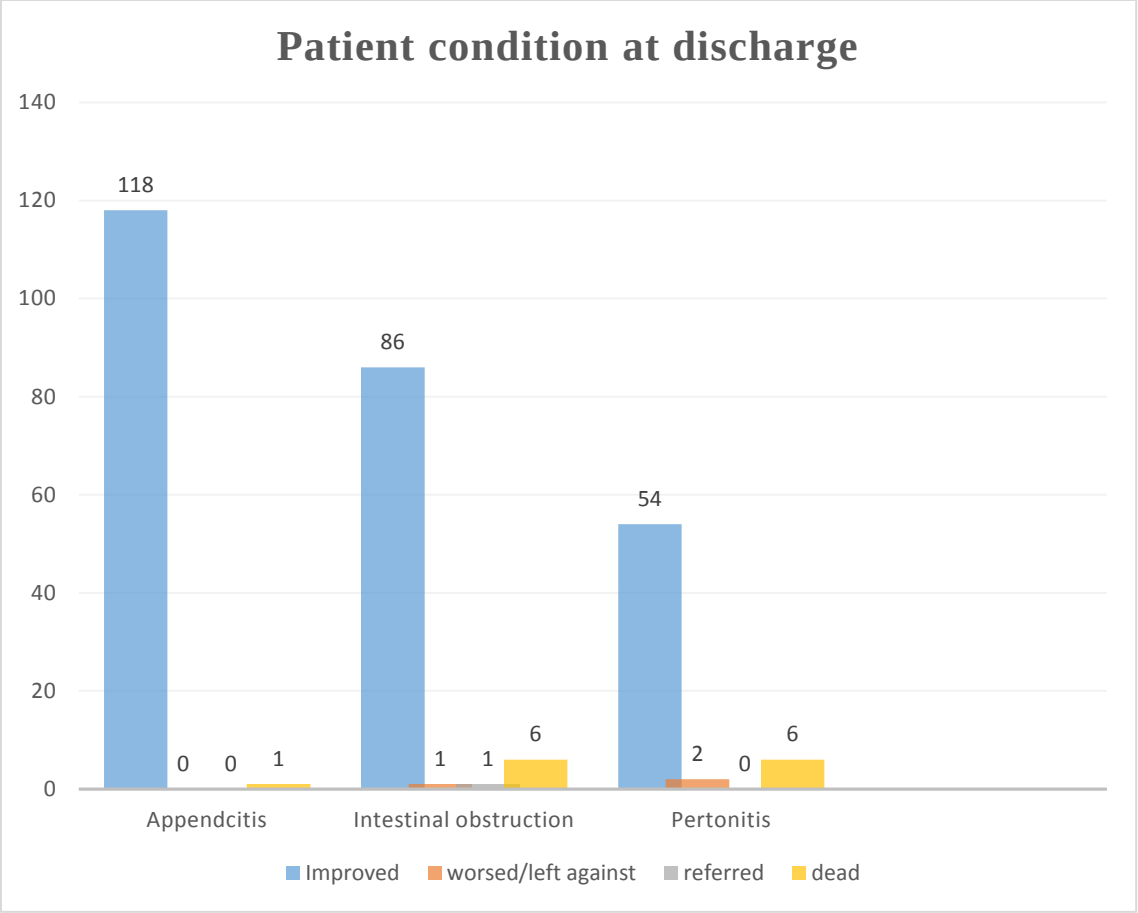

Figure 3:Frequency of condition of surgically treated patients at discharge in DMCSH from September 1, 2019G.C- August 3O,2020 G.C.

5.3Factors associated with management outcome of non-traumaticsurgicalacute abdomen in DMCSH.

Twenty variables were analyzed using binary logistic regression to get which prognostic factors associated with management outcome. Out of these ages, address, duration of illness, abdominaldistention, constipation, comorbid illness, bowel sound, bloodpressure, pulse rate, respiratory rate, post-operative diagnosis, duration of surgery and length of hospital stay are candidates for multiple logisticregression analysis. However, only duration of illness before operation, length of hospital stays, comorbid illness, and hypotension were significantly associated with the management outcome of non-traumatic acute abdomen in multivariable logistic regression (table 5).

Therefore, those the odds of presenting after 48 hours of illness before operation had 3.8 times more likelyunfavorable management outcome than those presented before 48 hours (AOR=3.8 ,95% CI: 1.6-8.9, p = 0.002).

Length of hospital stay (AOR=7.6, 95%CI: 3.26-18.1, P=0.001), patients who stayed for greater than 5 days had 7.6 times more likely un favorable management outcome as compared with patients stayed for less than and equal to 5 days.

Those the odds comorbid illness 3.6 times more likely un favorable management outcome than patients without comorbidity (AOR=3.6,95%CI:1.1-11.97, p=0.039)

Those who had blood pressure of less than ninety by sixty 0.4 times more likely un favorable management outcome as compare to blood pressure >=90/60(AOR=0.4,95%CI:0.16-0.8, p=0.01).

Table 5**:**Factors associated with management outcome among surgically treated non-traumatic acute abdomen patients in DMCSH, September 1, 2019G.C- August 3O,2020 G.C.

Variable	**Category**	**Management outcome**		**Crude odd ratio (95%CI)**	**Adjusted odds ratio (95%CI)**	**p-value**
		Unfavorable	**Favorable**			
Age	<=24	12	87	1	1	
	25-54	16	112	1.035(0.46-2.3)	0.75(0.27-2.07)	0.576
	>=55	14	34	2.98(1.25-7.1)	1.58(0.49-5.08)	0.441
Address	Urban	6	80	1	1	
	Rural	36	153	3.1(1.3-7.8)	1.62(0.5-5.19)	0.421
Duration of illness before operation	<48 hours	11	146	1	1	
	>=48 hours	31	87	4.7(2.3-9.9)	3.8(1.6-8.9)	0.002**
Symptoms and signs						
Abdominal distention	Yes	27	96	2.6(1.3-5.1)	0.9(0.3-3.2)	0.887
	No	15	137	1	1	
Constipatio	Yes	22	80	2(1.1-4.1)	0.8(0.3-2.4)	0.754

n	No	20	153	1	1	
Comorbid illness	Yes	7	11	4(1.5-11)	3.6(1.1-11.97)	0.039**
	No	35	222	1	1	
Bowel sound	Normal	15	134	1	1	
	Abnormal	27	99	2.4(1.2-4.8)	1.1(0.3-3.8)	0.939
Blood pressure	Normotensive	19	178	1	1	
	Hypotensive	23	55	0.25(0.13-0.5)	0.35(0.16-0.8)	0.01**
Pulse rate	Normal range	13	129	1	1	
	Tachycardia	29	104	2.8(1.4-5.6)	1.5(0.5--4.5)	0.468
Respiratory rate	Normal range	15	123	1	1	
	Tachypneic	27	110	2(1.01-4)	1.2(0.5-3.1)	0.634
Type of diagnosis	Appendicitis	6	113	1	1	
	Intestinal obstruction	16	78	3.86(1.4-10.3)	1.5(0.44-4.9)	0.535
	Peritonitis	20	42	8.96(3.4-24)	2.9(0.9-9.2)	0.072
Duration of	<2 hour	32	218	1	1	

surgery	>=2hour	10	15	4.54(1.9-11)	2.6(0.9-7.3)	0.075
Length of hospital stay	<=5days	9	173	1	1	
	>5days	33	60	10.57(4.8-23)	7.6(3.26-18.1)	0.001**

**Significant.

CHAPTER 6: DISCUSSION

6.1 Surgical Management Outcome

The aim of the present study was to analyze the surgical management outcome of non-traumatic acute abdomen and its associated factors at Deber Markos Comprehensive Specialized Hospital. The analyzed data showed that 15.3% with 95% CI (11.2-20) of all cases have unfavorable surgical management outcomes of NTAA, which was characterized by the presence of the recorded postoperative complications or death at the healthcare facility. The finding on this unfavorable outcome rate is in line with a study conducted Nekemte referral hospital (16.1%), Mettu Karl referral hospital (19.6%),Attat hospital Gurage Zone (17%)Mekelle hospital (16.9%) (21-23, 26),but it is lower than the studies

done in TAH (28%), Suhul General Hospital (20.5%), Arba Minch General hospital(22%) and St. Francis Referral Hospital,Tanzania (26.7%) (10, 11, 31, 35).

The possible reason for the difference might be due to variation in the distribution of the clinical and sociodemographic characteristics of the study participants, the knowledge and skill of the health professionals regarding the diagnosis and management of NTAA, the hospital internal setups itself, and the overall infrastructures of the study area.

6.2 Factors associated with management out come

This study revealed that duration of illness before surgery, length of hospital stay after surgery, comorbid illness and hypotension were factors significantly associated with the surgical management outcome of NTAA.

The duration of illness before operation ranges from 6-hour to14 days with median of 2 days.157(57.1%) of patents came within 48 hours of illness while118(42.9%)came after 2 days of illness.Statically significant in this study, those who presented after 48 hours of illness were 3.8 times more likely to hadunfavorable management outcome than before 48 hours (AOR: 3.8; 95% CI: 1.6-8.9, p = 0.002) is similar with the study done in Nekemte referral hospital that patents who had > 2 days of illness have 4.33 times more likely to have unfavorable outcome as compared to patent who came with < 2 days of duration [(AOR = 4.33, 95% CI (1.03- 18.12) and study done in Attat hospital patient presented within 2days of illness were more likely to be improved (AOR:5.7; 95% CI:

1.5, 22.2, p = 0.012)(22, 26).The possible reason for the delay of patients to attending a hospital might be due to lack ofawareness about the symptoms of acute abdomen, inadequate infrastructures, and transport accessibility especially for those patients who reside in rural areas, their distance from theprimary and\or tertiary healthcare facilities, and poor referral system between the levels of health facilities.

Length of hospital stay after operation range from 1 day to 43 days with median of four days. In this study, 93(33.8%) patients stay in hospital for more than 5 days. This was statically significant in who stay in hospital for more than 5 day had 7.6 times more likely un favorable management outcome as compared with patients stayed for less than and equal to 5 days (AOR=7.6, 95%CI: 3.26-18.1, P=0.001) ,the same is true study done in Nekemte referral hospital patient stay for more than five days 0.21 times had unfavorable outcome (AOR=0.21, 95%CI (0.06-0.73)and in other study hospital stay ≤8 days after surgery were about three time more likely to have favorable outcome(22, 34).The short length of hospital stay may decrease the chance of patients to acquirenosocomial infections, such as hospital-acquired pneumonia.

This study also shows that patients who had comorbid illness had about 3.6 times unfavorable outcome when compared to those without any comorbid disease(AOR=3.6,95%CI:1.1-11.97, p=0.039). This finding is congruent with a study conducted in University of Gondar ComprehensiveSpecialized Hospital(34). The comorbid conditions like diabetes may decrease thewound-healing process and increase the risk of postoperative complications occurrence as an unfavorable surgical management outcome of NTAA including incisionalsite infection and wound dehiscence.

Another significantly associated factor in this study is shock. Those who had blood pressure of <90/60 about 0.4 times unfavorable outcome than >=90/60(AOR=0.4,95%CI:0.16-0.8, p=0.01). which is similar to the study conducted in Arba Minch General hospital(35). These explained by shock result insufficient blood flow to the tissue of body then patient can develop different complications like acute renal failure, DIC and multiorgan failure.

Limitation

It might not representative for East Gojjam Zone population since it is institutional based.

CHAPTER SEVEN: CONCLUSION AND RECOMMENDATION

In this study we noticed emergency surgical operation for nontraumatic acute abdomen particularly for acute appendicitis was found to be the most common surgical emergency operations performed in DMCSH.In this study 15.3% of patient have unfavorable management outcome of surgically treated non traumatic acute abdomen. The commonest early postoperative complications other than death were wound infection (6.9%), sepsis (4.7%), leak (3.6%) and pneumonia (3.6%). Most of patients experienced post-operative complications were those who came late and related with developing peritonitis. The overallmortality rate of 4.72% found in this study.Determinant factors including duration of illness before surgery, length of hospital stay after surgery, comorbidity and hypotension were significantly associated with the surgical management outcome of NTAA.

Therefore, designing a strategy addressing these factors would be helpful to further increase the likelihood of favorable surgical management outcome for the patients attending hospital with NTAA, like creating public awareness. Improving knowledge of health professionals doing in the community (community health extensions), health centers and hospitals especially those doing in emergency department, these will increase early detecting, diagnosing and decreases mismanagement of the case. The responsible body, hospital staffs should develop resuscitation of surgical patients and early consultation ofseniors, Amhara regional health bureau prepare common management protocol for all hospitals and make a distribution of surgeons in hospitals with full equipment, will improve the health status before getting complication.

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ANNEX :2 CHECK LIST

Bahir Dar University College of Health Science Department of Medicine Data collecting Checklist. This checklist is prepared to assess emergency surgical operation performed for non-traumatic acute abdomen inDMCSH during target period. This will be filled by the data collectors from secondary data (from surgical operation registration book and patients profile card).

Consent Form

My name is _____ I am working with Mahlet Adelew who is doing a research as partial fulfillment of the requirement for the degree of Master of Integrated Emergency Surgery and Obstetricsat Bahir Dar University. We are going to collect information from the client's card to assessmanagement outcome and associated factors of surgical treated non traumatic acute abdomen in Deber Markos Comphernsive Specialized Hospitalfrom September 1/2019-Augest30/2020.

The patient's name will not be written in this form and the information I get from the client's card is kept confidential. If you do not want to allow me to collect information from the clients' card, you have the right to do so. However, your willingness to allow me to do so will be appreciated.

Thanks

Part I socio demographic data characters	
1.age	.....in years
2.sex	1. Male
	2. Female
3.Adress	1.Urban
	2.Rural
	Yes ...1 No ...2
	1.Nausea
	2.Abdominal pain
	3.Vomiting
Part II presenting complaints	4.Abdominal distension
Of patient	5.Constipation
	6.previous abdominal
	surgery
	7.Fever
	8.others
Vital sign	BP.___PR.___RR.___Temp.__

Abdominal funding	Abdominal distention	
	Abdominal tenderness	
	Guarding and rigidity	
	Others…	
	Bowel sound	normal
		hyper active
		hypo active
		Absent

Part III Duration of illness

before operation in hours/days ……

Part (p) IV Diagnosis (post-operative)	1. Appendicitis
	2. Intestinal obstruction
	3. peritonitis
	4. others…
PIV1 If Appendicitis	1. Acute Appendicitis
	2.Appendiceal mass

	3. Perforated appendicitis
PIV2IF Intestinal obstruction	1. Large bowel
	2. Small bowel
PIV2.1IF large bowel	1.Sigmoid volvulus
	2. Colorectal cancer
	3. ileosigmoid knotting
	4. intussusception
	5.others ….
PIV2.1.1:If sigmoid volvulus	1.viable
	2.non-viable
PIV2.1.2: If ileosigmoid knotting	1.viable
	2.non-viable
PIV2.1.3:If intussusception	1.viable
	2. non-viable
PIV 2.2: If small bowel	1. Primary volvulus
	2. Adhesion/band
	3. Hernia
	4. Intussusception
	5 Others
PIV 2.2.1:If primary volvulus	1.viable
	2.non-viable
PIV 2.2.2:If adhesion/band	1.viable
	2.non-viable

PIV 2.2.3:Ifhernia	1.viable 2.non-viable
PIV 2.2.4: If intussusceptions	1.viable 2.non-viable
PIV3:If peritonitis, what is the primary cause	1.Perforated appendicitis 2. Gangrenous large bowel obstruction 3. Gangrenous small bowel obstruction 4. Perforated pud 5. Primary peritonitis 6.Others (if there mention)
PV: presence of comorbid illness	1.yes 2.No
PVI: Type of surgical procedure done	1.Apendectomy 2. Resection and anastomosis 3. Untwisting the volvulus 4. Herniorrhaphy 5.Adhesinolisis and band release 6.Abscess drainage 7.Graham patch 8.Colostomy 9.others .....
PVII: Duration of surgery in hours…….	
PVIII: What was the complication postoperatively if any	Yes...1 No..2 1.Anastomotic leak 2.Bleeding

	3.Collection
	4. Sepsis
	5. Wound infection
	6. Pneumonia
	7.Others (if any, mention)
PIX: If yes in Part VIII (what is done	
(Write in short)	
Part X.Length of hospital Stay in days…	
Part XI. Management out comes	1.Favourable
	2.Unfavourable
Part XII. Condition of the patient on discharge	1. Improved
	2. Worsened
	3. Referred
	4. Dead