



**INSTITUTE OF HEALTH
FACULTY OF MEDICAL SCIENCES
DEPARTMENT OF BIOMEDICAL SCIENCES
ANATOMY COURSE UNIT**

**SPECTRUM OF DISEASE AND TREATMENT OUTCOME OF GASTRO
INTESTINAL OBSTRUCTION AT THREE GOVERNMENTAL REFERRAL
HOSPITALS IN SOUTHERN ETHIOPIA: HOSPITAL BASED PROSPECTIVE
STUDY**

BY: NIGIST SEYOUM (B.Sc.)

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JIMMA, ETHIOPIA

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BY: NIGIST SEYOUM (B.Sc.)

PRINCIPAL ADVISOR

1. TILAHUN ALEMAYEHU (M.SC, ASSISTANT PROFESSOR IN ANATOMY)

CO-ADVISORS

2. SOLOMON TEFAYE (M.SC IN ANATOMY)
3. NIGUSE HAMBA (M.SC IN ANATOMY)

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ABSTRACT

BACKGROUND: *Gastrointestinal tract (GIT) is a single long tube about 5–7 meters long extending from the mouth to the anus, and functions to digest food and provide nutrients to the body. Gastrointestinal obstruction is a major cause of morbidity and financial expenditure in hospitals around the world, accounting for almost 15% of surgical emergency department visits for acute abdomen. However, studies on gut obstruction are scarce in Ethiopia in general and in Southern Region in particular.*

OBJECTIVES: *To assess the types, causes, management and treatment outcome of gastrointestinal obstruction and associated factors with the ultimate management outcome in Southern Ethiopia.*

METHODOLOGY: *This is hospital based prospective study for three months from May 01 to August 01, 2018 at three governmental referral hospitals in Southern Ethiopia, namely Hawassa referral hospital, Yirgalem generalized hospital and Dilla referral hospital. Patients admitted at the surgical emergency units of the hospitals for acute abdomen and confirmed diagnosis of gastrointestinal obstruction were recruited as study participants and followed during the course of their management at the hospitals till discharge. The data were collected by trained data collectors about the objectives of the study. The collected data were entered into Epi Data 3.1 version and transported to SPSS for statistical analysis. Binary logistic regression analysis was conducted to identify factors associated with the management outcomes of gastrointestinal obstruction at the study hospitals.*

RESULTS: *Altogether, a total of 156 patients with confirmed diagnosis of gut obstruction at the three hospitals were studied. The male to female ratio was 1.6:1. Age ranged 2 to 80 years, with a mean of 34.1 ± 13.7 years. Large bowel obstruction (LBO), small bowel and gastric outlet obstructions were the common anatomical types of obstructions in decreasing order. The chief complaints of the patients at admission were abdominal pain, vomiting, abdominal distension and constipation. The majority of cases were managed surgically; resection and anastomosis was the most common intra-operative procedure underwent. The most common pathologies were volvulus and adhesion. Adhesiolysis was the most common post-operative complication evident in 18(12%) cases. In almost 12% (18 out of 150) of the study population, the treatment outcome was unfavourable with overall mortality rate of was 2.7% (4/150). The significant predictors of the outcome were length of time lapse from onset to admission,*

over 24 hrs [AOR=0.034; 95% CI: 0.004 -0.287; p=0.002] and gangrenous sigmoid volvulus [AOR=4.01; 95% CI: 1.445-15.118; p=0.010].

CONCLUSION AND RECOMMENDATION: *Incidence of gastrointestinal obstruction in the study areas was relatively high, LBO being the commonest obstruction. Fortunately, mortality risk from the condition was less than 3.0%. Late admission was the independent predictor of mortality. Improving health seeking behaviour and public awareness on the role of timely admission to prompt treatment in reducing death from gut obstruction is recommended.*

Keywords: *Gastrointestinal obstruction, disease spectrum, management outcome, early admission, SNNPR, Southern Ethiopia*

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ABBREVIATIONS/ACRONYMS

AOR	Adjusted odds ratio
CI	confidence interval
cm	centimetre
COPD	chronic obstructive pulmonary disease
COR	Crudes odds ratio
CT	Computed tomography
DM	diabetes mellitus
DRH	Dilla University Teaching Referral Hospital
GI	Gastrointestinal
GIO	gastrointestinal obstruction
GIT	gastrointestinal tract
GOO	gastric outlet obstruction
HPS	hypertrophic pyloric stenosis
HRH	Hawassa Referral Hospital
in	inch
IO	intestinal obstruction
IQR	Interquartile range
km	kilometre
LBO	large bowel obstruction
OR	odds ratio
RA	Resection and anastomosis
SBO	small bowel obstruction
SI	small intestine
SMAT	superior mesenteric artery thrombosis
SNNPR	South Nations Nationalities and People Region
YGH	Yirgalem General Hospital

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The gastrointestinal tract (GIT) is a single long tube about 5–7 meters in a living person, extends from the mouth to the anus, and functions to digest food and provide nutrients to the body (1). Anatomically, it consists of a muscular wall that surrounds variable amount of a central lumen, and includes pharynx, esophagus, stomach, and intestines. At several levels, the lumen reveals a series of dilatations and constrictions that are subject of a variety of disorders and diseases (2–4). Histologically, the gut wall consists of four layers: mucosa, sub mucosa, muscularis-externa and serosa or adventitia from inside to outside in order (5). Rhythmic contractions of the muscularis externa produce peristaltic movements that propagate digestive contents including food, fluid and waste materials down the entire length of digestive tube. Transit of digestive content depends not only on an intact state of GIT lumen, but also on peristalsis (6). Blockage or hindrance of the passage of these contents, also known as gastrointestinal obstruction (GIO), is a situation when the digestive contents cannot be forced further in aboral direction (7–10).

The stomach, the most dilated portion of the GIT located in the upper abdomen just below the diaphragm, is a saclike structure with thick muscular wall. It can expand significantly to store all the food from a meal for both mechanical and chemical processing. The stomach contracts about three times per minute, churning the food and mixing it with gastric juice (6). Thousands of gastric glands in the lining of the stomach secrete fluid like water, hydrochloric acid, an enzyme called pepsin, and mucin (the main component of mucus). Acidic environment is created by hydrochloric acid that pepsin needs to begin breaking down proteins. It also kills microorganisms that may have been ingested in the food. To protect the effects of the acid and pepsin, the stomach is coated by mucin. Chyme is a processed food in stomach about four hours or less after a meal, begins passing a little at a time through the pyloric sphincter into the first portion of the small intestine, duodenum (1). This region of the stomach, known as gastric outlet is one of the commonest sites of obstruction. Causes of gastric outlet obstruction are many including growth tumor cells in the peritoneal cavity, especially from mucinous tumors and infantile hypertrophic pyloric stenosis (1).

Intestine, clinically also known as bowel, is the portion of the digestive tract distal to the stomach, which is held in place in the abdomino-pelvic cavity by membranous folds of visceral peritoneum, mesenteries. In humans, based on its outer diameter, the intestine is divided into two major sections: the small intestine, which is a narrow, twisting tube, about 2.5 cm (1 in) in diameter and 4-5 m in length, where most of digestion and absorption take place; and the large intestine, which is shorter in length (about 1.5 m long) but larger in caliber (about 6 cm in diameter) than the former is the site where vitamins are extracted, water is absorbed, and solid waste is excreted (1,5,6).

The small intestine (SI), clinically also known as bowel is the longest portion of GIT thrown into coils that occupy the center of the abdominal cavity and fill most of the lower abdomen. It divided into duodenum, jejunum and ileum. Duodenum is the most proximal, horseshoe-shaped portion that begins at the gastric outlet, pyloro-duodenal junction through which the contents of the stomach pass into the small bowel. The circular pyloric constriction on the surface of the stomach usually indicates the location of the pyloric sphincter, and may be marked by a prepyloric vein that crosses its anterior surface in a caudal direction (1). The duodenum surrounds the head of the pancreas and the pancreatic duct, as well as ducts from the liver and gall bladder that open into it. Jejunum is middle part of the small intestine, extending from the duodenum to the ileum and the terminal portion is the ileum, which leads to the side of the first part of the large intestine, the cecum. The mucosa of the small intestine is thrown into abundant finger-like folds, villi that increase surface area available for digestion and absorption. Each villus consists of a core of vascularized loose areolar connective tissue, with abundant blood capillaries and lymph capillary or lacteal and externally covered by a simple columnar epithelium with interspersed goblet cells (5).

The large intestine is subdivided into the cecum, ascending colon, transverse colon, descending colon, sigmoid colon, and rectum. The cecum is a swollen sac located in the lower right quadrant of the abdominal cavity. Ileocecal valve is a membranous structure between the cecum and the small bowel that regulates the passage of food material from the small intestine to the large intestine and also prevents the passage of toxic waste products from the large intestine back into the small intestine. The vestigial vermiform appendix is blind ending tube that joins the posteromedial wall of the caecum below the ileocolic junction, and often become inflamed and obstructed (5). The ascending colon is along the right side of the abdominal cavity; the transverse colon runs across the body to the left side,

where the descending colon travels downward. The sigmoid colon is the S-shaped portion of the large intestine as it enters the pelvic cavity; due to its twisted nature, it is subject to volvulus, i.e. sigmoid volvulus (6–8). The rectum, about 15 cm (6 in) long, is almost straight, terminal portion of the large intestine (1). At the exit of the rectum, called the anus, and is a round muscle, the anal sphincter that closes the anus.

GIO, a mechanical or functional blockage arising from a structural or physiological abnormality that hinders progression of gut contents distally, is the most commonly encountered surgical emergency globally (9–13). The severity of the disease depends on duration and site of obstruction. When occurring in the upper gastrointestinal tract such as in the esophagus, stomach or duodenum, it tends to have a less urgent presentation, whereas in the jejunum, ileum and large bowel it often presents as a medical emergency (14–16). A wide range of pathologies can inflict both the small and large intestines. Intestinal obstruction accounts for approximately 15% of all emergency department visits for acute abdominal pain (7–12). Intestinal obstruction can be majorly differentiated into small bowel and large bowel obstruction. Intestinal obstruction can also be classified as partial or complete, simple or complicated. Partial obstruction allows the passage of some liquid contents and gas whereas complete obstruction does not allow any bowel contents to pass through point of obstruction. Unlike simple obstruction, in complicated obstruction blood circulation to a segment of bowel is compromised that results in ischemia, infarction, and perforation (13–17).

1.2 Statements of the Problems

Gastrointestinal obstructions (GIO) is one of the most common inpatient diagnosis, and a frequent cause of outpatient hospital admissions and surgical emergency worldwide with high risk of mortality (1). Nearly 20% of hospital general surgical emergency admissions are for the management of intestinal obstruction (6). It is a frequently encountered problem in abdominal surgery that requires immediate admission, unless otherwise could end with higher risk of mortality. In developing world, acute bowel obstruction due to mechanical factors is among the most common surgical emergencies being encountered frequently in emergency department associated with high morbidity and mortality (18–25). Although both genetic and environmental factors may be involved in the pathogenesis, the certain causes of these diseases are still unclear (8, 12). This makes it essential that studies are made

periodically in every region to define the local causes with the idea to do work on prevention (17). It is due to this reason that the current proposed study is impressive.

Besides, the regional and timely fluctuation in the spectrum of disease-causing gut obstruction emphasizes on regular studies to evaluate the causes is helpful in diagnosis and therapeutics. Unfortunately, compressive scientific data on the magnitude, pattern, etiology, clinical presentation, management options and treatment outcome and determinants of GIO are lacking. The very few such studies available from Ethiopia are retrospective studies based on card reviews and deal with intestinal obstruction only (8). Therefore, more conclusive prospective longitudinal studies from Ethiopia are expected to document the scientific findings regarding gut obstruction and its health impact in Ethiopia. In line with this, the current study was designed to describe the aetiology, clinical presentation, management and outcome of gastrointestinal obstruction at the study area.

1.3 Significance of the Study

Although biologically plausible data based on relevant local formative research are needed to plan any type of effective health intervention programme, such data are currently scarce in Ethiopian context with regard to the magnitude, pattern and the public health burden of gastrointestinal obstruction. In addition to the dearth in information about the incidence, causes, management options and determinants of treatment outcomes of gut obstruction, community awareness and knowledge on the clinical symptoms and health seeking behaviour for early treatment is also low.

It is due to this reason that the current study is designed to addresses this critical information gap and enrich local literature on the incidence, magnitude, spectrum and determinants of gastrointestinal obstruction in the study area. The lesson possibly learned from the proposed study could also be used as a baseline for future studies in other settings on the issues around gastrointestinal obstruction. The result of the study will also be used as inputs for policy makers and program implementers at national as well as regional levels to design evidence-based intervention strategies to tackle the problems of mortality from gut obstruction.

CHAPTER TWO

LITERATURE REVIEW

2.1 Signs and Symptoms of Gastrointestinal Obstruction

Manifestations of GI obstruction can range from a fairly good appearance with only slight abdominal discomfort and distention to a state of hypovolemic or septic shock (or both) requiring an emergency operation. The most common gastrointestinal obstruction sign and symptoms are abdominal pain, heartburn, nausea and vomiting, altered bowel habits, GI bleeding, and jaundice. Others are dysphagia, anorexia, weight loss, fatigue, and extra-intestinal symptoms (26–30).

Study reports from different countries show that acute intestinal obstruction is one of the common life-threatening emergencies all over the world presenting as acute abdomen and requiring surgical intervention (31–33). Intraluminal obstruction classically elicits intermittent or colicky abdominal pain that is not as well localized as the pain of parietal peritoneal irritation. However, the absence of cramping discomfort should not be misleading because distension of a hollow viscous may also produce steady pain with only rare paroxysms. Small-bowel obstruction often presents as poorly localized, intermittent peri-umbilical or supra-umbilical pain (19). As the intestine progressively dilates and loses muscular tone, the colicky nature of the pain may diminish. If there is traction on the root of the mesentery, superimposed strangulating obstruction, and pain may spread to the lower lumbar region. The colicky pain of colonic obstruction is of lesser intensity, is commonly located in the infra umbilical area, and may often radiate to the lumbar region (20).

It should be noted that abdominal pain also results from GI disease and extra intestinal conditions involving the genitourinary tract, abdominal wall, thorax, or spine. Visceral pain is in the midline location and vague in character and whereas parietal pain is localized and precisely described. Common inflammatory diseases with pain include peptic ulcer, appendicitis, diverticulitis, inflammatory bowel disease, and infectious enterocolitis. Other intra-abdominal causes of pain include gallstone disease and pancreatitis. Non-inflammatory visceral sources include mesenteric ischemia and neoplasia (21).

Abdominal distension or acute abdomen is another symptom of IO. This could also be due to liver tumour masses, or hepatomegaly. Physical examination may reveal abdominal distension with tympani, ascites, visible peristalsis, high-pitched bowel sounds, and tumour

masses. Erect plain abdominal films may reveal multiple air-fluid levels and dilation of the small or large bowel. Acute cecal dilation to >12–14 cm is considered a surgical emergency because of the high likelihood of rupture (21). Vomiting can be intermittent or continuous. Patients with complete obstruction usually have constipation. Abdominal pain (89%) and vomiting (82%) are more frequent in the study done in India and out of 63 patient 20 (31.7%) of them has previous abdominal surgery(34). The clinical features of abdominal pain (88%), vomiting (78%), distension (66%) and constipation (54%) were the main symptoms or reason for hospital admission (35). The most common symptom was abdominal pain, present in all 50 cases (100%) followed by distension in 47 cases (94%), vomiting 45 cases (90%) and least being constipation in 37 cases (74%) (36). In another study involving 60 obstruction cases, 54 (90%) patients were presented with distension, with other symptoms including constipation in 52 cases (86.7%) and vomiting in 47 cases (78.3%). Thirty-two patients (53.3%) were presented with relevant complaints of abdominal pain of more than 4-days duration (37). The most common symptoms were abdominal pain (88%) and vomiting (80%) and the common sign were tachycardia (80%) and visible intestinal peristalsis (60%) (38).

2.2 Diagnosis and prevalence of Gastrointestinal Obstruction

Computed tomography (CT) scan is useful in defining the extent of disease and the exact nature of the obstruction and differentiating benign from malignant causes of obstruction in patients who have undergone surgery for malignancy. Malignant obstruction is suggested by a mass at the site of obstruction or prior surgery, adenopathy, or an abrupt transition zone and irregular bowel thickening at the obstruction site (22). Benign obstruction is more likely when CT shows mesenteric vascular changes, a large volume of ascites, or a smooth transition zone and smooth bowel thickening at the obstruction site. In challenging patients with obstructive symptoms, particularly low-grade small-bowel obstruction (SBO), CT entero-colitis often can help establish the diagnosis by providing distension of small-bowel loops. In this technique, water-soluble contrast is infused through a nasogastric tube into the duodenum or proximal small bowel followed by CT images. The prognosis for the patient with cancer who develops intestinal obstruction is poor; median survival is 3–4 months (22). About 25–30% of patients are found to have intestinal obstruction due to causes other than cancer. Adhesions from previous operations are common benign cause (22).

Although gut obstruction could possibly occur at any site from oral cavity orifice to anal canal, only intestinal obstruction is extensively addressed in literature and classified as small bowel and large bowel obstruction (26). Intestinal obstruction may be presented in the form of acute or chronic onset. Literature evidence shows that about 15% of the patients admitted for acute abdomen have intestinal obstruction and small bowel obstruction accounts for 80% of these cases worldwide (26). Bowel obstruction may be classified into two types: dynamic (mechanical) and adynamic (paralytic ileus and pseudo-obstruction) (2). In dynamic IO, peristalsis works normally against a mechanical obstruction and it is a common and potentially dangerous surgical emergency with high morbidity and mortality worldwide. In adynamic obstruction however, there is no mechanical obstruction, and peristalsis is usually absent or inadequate (e.g. paralytic ileus or pseudo-obstruction) (24). Moreover, dynamic bowel obstruction may occur in an acute or chronic form. Acute intestinal obstruction accounts for approximately 1–3% of all hospitalizations and a quarter of all urgent or emergent general surgery admissions globally with high morbidity and mortality (32). As prospective study done in India out of 63 patients participated in the study the male to female ratio were 1.5:1 and the mean age were 31.8 ± 16.6 (34). As study done in India the common affected age group was 31-40 and 51-60 years that were 20% for each in the total study and the mean age was 45 years, and male to female ratio was 4:1 (35).

In another study report from India, majority of patients 66% were from rural area (35), with a mean age of 49.5 years and male to female ratio of 1.7:1. As study done in Pakistan with paediatrics obstruction which included only under 14 children, the male to female ratio was 1.9:1(36). Another study done on 423 under 14 children with intussusceptions sat 9 specialized centres in South Africa, the male to female ratio reported was 1.3:1 and the mean age was 12–14 months, while the mean duration of symptoms was 1.5 days. Out of the total patients, 320 (76%) had black African ethnic origin, 92 (22%) were ancestry of Indian people and only 10(2%) were of white ancestry so in these reports the black African children were most affected with intussusceptions (37). As study done India the male to female ratio were 3.33:1 and the common age group affected was 51-60 year (38). In a study done in Mogadishu, Somalia, the most affected age groups were between 21-30 and 51-60 years, each accounting for 35.5%, followed by 31-40 years age group accounting for 15%, with male to female sex ratio of 4:1 (38). In that report, mechanical SBO accounted for 61.1% while mechanical LBO accounted for 15.6% (39). As a four-year (March 2008 to February 2012) descriptive prospective study done in Tanzania, incidence of intestinal obstruction

among adults admitted at a general surgical ward was 342 with the diagnosis of dynamic (mechanical) bowel obstruction and underwent surgical intervention. Males more affected and the age of patients at presentation ranged from 11 to 78 years and the most affected (60.2%) group were those aged 40 years or younger (7). As study report from Nigeria, the prevalence of acute intestinal obstruction with previous history of surgery was 46 among them 11 were post-operative adhesion (9). As study done in India the prevalence of acute intestinal obstruction was 118/2044 cases in surgery unit. The age ranged from 2 days to 82 years with a mean age of 33.2 years and according to that report, male are the most affected in all age groups (10). As study done in southern Iran, the prevalence of intestinal obstruction was 411 patients with initial diagnosis of bowel obstruction. Males were two times more likely affected than females. The mean age of the patients was 48.2 ± 19.7 years. Besides, 73.6% were observed and 26.4% were operated (21).

Literature evidence also shows prevalence of bowel obstruction ranges between 4% and 25% in ovarian carcinoma and colorectal cancer. In patients with advanced ovarian cancer the frequency of bowel obstruction can be as high as 42% and is a major proximate cause of death(7). Such reports from Ethiopia are extremely rare. A cross sectional study report from Adama referral hospital, Eastern Ethiopia, shows prevalence rate of intestinal obstruction 21.8 % among acute abdomen and 4.8 % of total surgical admissions (8).

2.3 Causes of Gastrointestinal Obstruction

Post-operative adhesion is an important cause of acute intestinal obstruction globally. It constitutes the commonest cause of intestinal obstruction in the Western world but is second to obstructed/strangulated hernias as a cause of acute intestinal obstruction in tropical Africa (31). Acute intestinal obstruction is a frequently encountered problem and a common cause of hospital admissions in emergency surgical departments and a significant cause of morbidity and mortality (22). The commonest cause of intestinal obstruction was postoperative Adhesions (40%) followed by obstructed Hernia (30%) (35). External hernia (50%) was the commonest cause of intestinal obstruction followed by postoperative adhesion (39%) (3). The co-morbid diseases are DM, Hypertension, COPD (chronic obstructive pulmonary disease) and ischemic heart disease (36). As study done in Pakistan the most common clinical cause was intussusception 15 (62.5%), followed by obstructed inguinal hernia (16.7%) and post-operative adhesion was the 2nd common cause when compared to other causes (37). As study done in India the most common cause of intestinal

obstruction in their study was volvulus & postoperative adhesions. The next common cause was obstructed hernia (39). A the study done in Somalia, Mogadishu shows adhesions and bands 66(36.7%) the most common cause of obstruction followed by strangulated hernias 30 (16.7%) and volvulus (12.7%) large gut volvulus (8.3%) and small gut volvulus (4.4%) (40). As study done in Tanzania and Pakistan the underlying cause of intestinal obstruction was intestinal tuberculosis (11, 37). As study done in Saudi Arabia, 10% to 48% of bowel obstructions in cancer patients are due to benign causes, such as adhesions, volvulus, intussusceptions and fibrosis from radiation enteritis or intra-abdominal Diabetic neuropathy. Constipation and medications such as opioids and anticholinergic drugs might also contribute to bowel obstruction, whether mechanical or functional, by slowing down intestinal transit or further blocking a narrowed area (14).

As study done in Tanzania the most common cause of mechanical bowel obstruction was obstructed hernia (32.7%), followed by obstructive band or adhesion (26.7%) (11). In low socioeconomic status, intestinal helminths like ascariasis are also the causes of acute abdomen and gut obstruction (14, 15). A case report from Japan shows mental retardation could cause intestinal obstruction and other burdens of the society (14). Study report from Nigeria also show post-operative adhesion is the commonest cause of acute intestinal obstruction (9).

Adhesions are fibrous bands of scar tissue that form between internal organs and tissues, abnormally joining them together. They usually form after pelvic or abdominal surgery and are a frequent cause of intestinal obstruction. Intra-abdominal adhesions between previous abdominal scar and underlying organ occur commonly as a result of laparotomy (20). Although not well established, surgical procedures such as appendectomy are common operations leading to post-operative adhesion (10, 18). Obstructed femoral hernia is another rare cause of bowel obstruction reported and they suggested that surgeons should suspect femoral hernias one of the causes of acute bowel obstruction in emergency (19). As per study done in Adama, Eastern Ethiopia, the most common cause of small bowel obstruction was intussusceptions (30.9 %), followed by small bowel volvulus (30.3 %). And the large bowel obstruction was caused by sigmoid volvulus (69.0 %) followed by colonic tumour (13.8 %) (8). In literature, peptic ulcer diseases and cancer are implicated in gastric outlet obstruction.

2.4. Clinical Management options and Treatment Outcome of GIO

Scientific literature on the management options and outcome of the entire gut obstruction is scarce. The very few reports on this issue are only for intestinal obstruction (7–11). The management of intestinal obstruction depends on the extent of obstruction, estimated life expectancy, the functional status of the major organs, options for further antineoplastic therapy and the underlying disease condition such as malignancy. The initial management should include surgical evaluation. Unfortunately, operation is not always successful and may lead to further complications with a substantial mortality rate. Laparoscopy can diagnose and treat malignant bowel obstruction in some cases. Self-expanding metal stents placed in the gastric outlet, duodenum, proximal jejunum, colon, or rectum may palliate obstructive symptoms at those sites without major surgery. Patients known to have advanced intra-abdominal malignancy should receive a prolonged course of conservative management, including nasogastric decompression. Percutaneous endoscopic or surgical gastrostomy tube placement is an option for palliation of nausea and vomiting, the so-called “venting gastrostomy.” Treatment with antiemetic, antispasmodics, and analgesics may allow patients to remain outside the hospital. Octreotide may relieve obstructive symptoms through its inhibitory effect on gastrointestinal secretion. Glucocorticoids have anti-inflammatory effects and may help the resolution of bowel obstruction. They also have antiemetic effects.

According to a study report from India (31), intestinal obstruction due to adhesions was present in 47 patients (31 males and 16 females). Out of these, 20 patients (42.6%) were managed conservatively and 27 patients (57.4%) required surgical exploration. Adhesiolysis was the most common procedure done (100%) (24,25,31,40). According to study done in Tanzania the right hemi colectomy with ileal transverse anastomosis were the most surgical procedure performed in 55.9% of the patients and anti-tuberculous drug were received by all patients postoperatively for a period of one year and the most common post-operative complication (42.8%) was surgical site infection (SSI) and it is common among HIV positives than HIV negatives patients(41). As study done by Omit Ujha (34), out of 63 patients, 44 (69%) underwent surgery and the most common site of obstruction was ileum and the most common cause was adhesion (33%), followed by small intestinal stricture (16%) (34).The common procedure performed were adhesiolysis (34%), resection and anastomosis of bowel (30%) and stricturoplasty (16%) and two patients died post operatively at the 2nd and 4th days (34). As the study reported from India, out of 50 cases, 9 cases were complicated out of these septicaemia was 5 cases, respiratory tract infection was 2 cases,

wound infection in two cases occurred and 7(14%) were died (35). In another study from same country, wound infection (12%) was the commonest complication noted in their study, followed by wound dehiscence (6%) and septicaemia (6%). Out of 50 patients, 5 patients were died in postoperative period. The overall mortality rate in their study was 10% (36). In other reports by Surhabah et al (37), resection and anastomosis was the commonly performed surgical procedure 16 (45.7%), followed by adhesiolysis in 5 (14%) and band excision in 4 (11.42%) (37). There was no complication noted in 43 (71.7%) cases, while death occurred in 9 (15%) cases. Wound infection was present in 2 (3.3%) patients and other complications were negligible. Four (44.4%) deaths occurred due to mesenteric ischemia. Deaths were also due to sigmoid volvulus in 2 (22.2%), carcinoma in 2 (22.2%) (37).

As study done in Pakistan, mortality rate was 2.98%. One patient died as a sequel of meningitis. Resection of gut and anastomosis was carried out in 18(26.86%) patients (38). Another study shows resection and anastomosis was done in 32% of cases, Adhesiolysis in 26% of cases and Adhesiolysis with herniography and RA with loop Ileostomy done in 10% of each cases. In the post-operative complication result of study in India there was 5 cases of septicaemia, 2 cases of respiratory tract infection and 5 cases of wound infection. And 7(14%) mortality was happen. The majority of deaths were due to complications, like, septicaemia, peritonitis, respiratory infection (39). In a report from Somalia, conservative management was carried for 94(60%) of patients while 64(40%) underwent surgery. Among surgically managed groups, 9.4% had hernioraphy with or without resection and anastomosis, 7.8% had adhesiolysis and band release, while 6.7% underwent segmental bowel resection. Sixteen (8.9%) patients were post-operatively complicated (40). Association between types of IO, hospital stay and patients' age were reported statistically significant. In addition, the relation between residence and time since illness was reported as significantly associated (40).

2.5 Conceptual Framework

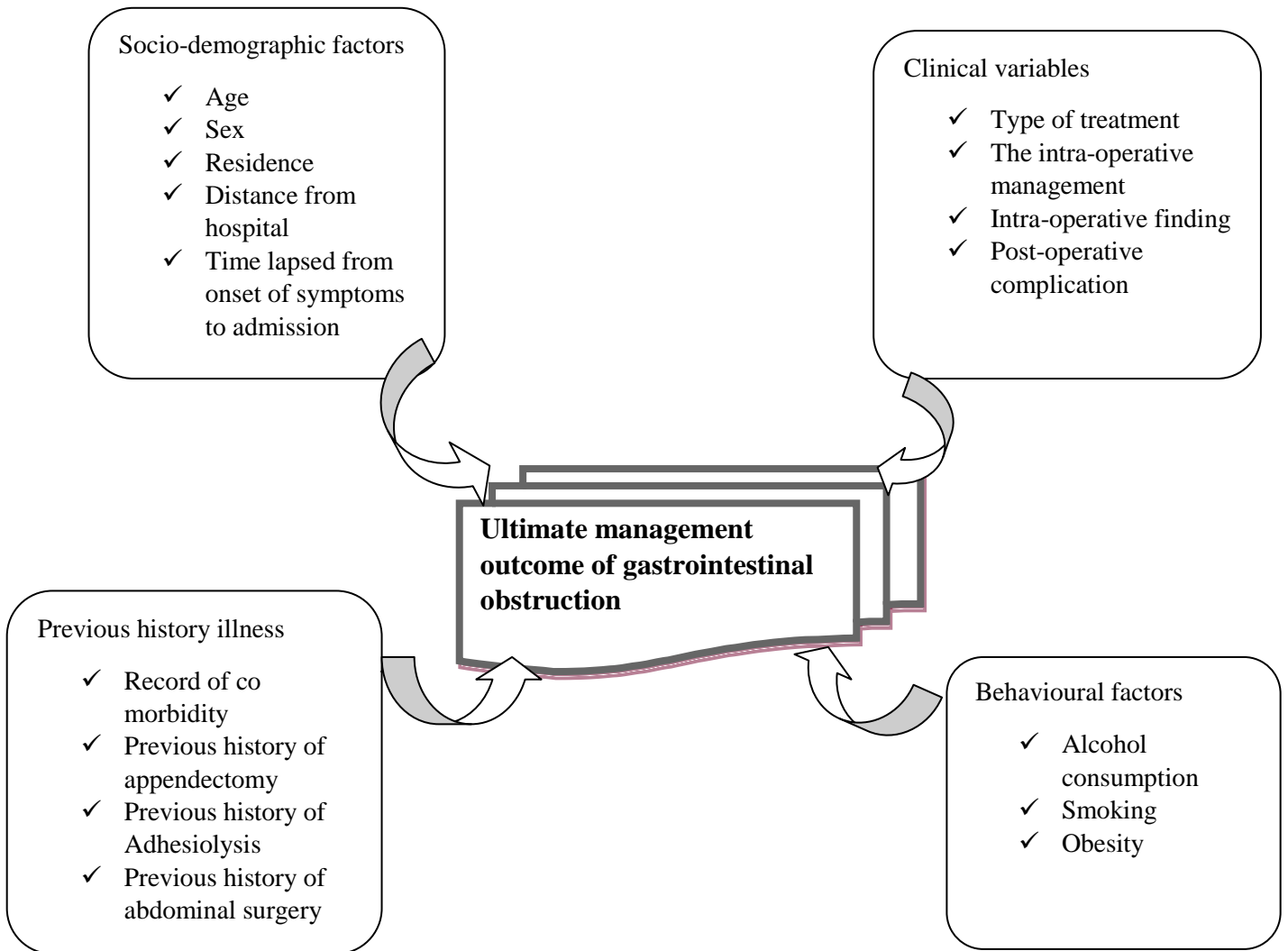


Figure 1 Possible factors associated with treatment outcome of gastrointestinal obstruction.

CHAPTER THREE

OBJECTIVES

3.1 General Objective

To assess the types, causes, management and treatment outcome of gastrointestinal obstruction, and factors associated with unfavourable management outcome at three governmental referral hospitals in Southern Ethiopia.

3.2 Specific Objectives

- ✓ To assess the incidence and anatomical types of gastrointestinal obstruction at the study area
- ✓ To describe the causes and patient-related characteristics of gastrointestinal obstruction in the study population
- ✓ To describe the distribution of time duration from admission to discharge (hospitalization= length of hospital stays)
- ✓ To determine factors associated with the management outcomes of gastrointestinal obstruction

CHAPTER FOUR

METHODS AND PARTICIPANTS

4.1 Study Area and Period

This study was conducted from May 01 to August 01, 2018 at three purposively selected public teaching hospitals in South Nations Nationalities and Peoples' Region (SNNPR), Southern Ethiopia. The study hospitals were Hawassa University Teaching Referral Hospital, Yirgalem General Hospital and Dilla University Teaching Referral Hospital. Hawassa University Teaching Referral Hospital (HRH) is found in Hawassa town, a pleasant lakeside town about 275 km from Addis Ababa in the South and a seat of both Sidama Zone and SNNP regional state administrations. HRH was started in 2003 and is attached to Hawassa University, College of Health Sciences. It has different departments that provide both outpatient and inpatient healthcare services to roughly 15 million people in and around SNNPR. Currently, the hospital has 400 beds and provides general and specialty level services to over 90,200 outpatients, 18,116 hospitalized patients and 1,092 emergency cases annually.

Yirgalem General Hospital (YGH) with its Yirgalem Hospital Medical College is found in Yirgalem town, which is another city administration in SNNPR located at 317 km south of Addis Ababa and 47 km from Hawassa. The hospital has inaugurated its foundation in January 1968. Currently, YGH is one of the General Hospitals in the SNNPR serving about 4 million people in its catchment area. It has four main departments (Medical, Surgical, Paediatrics and Gynaecology/Obstetric wards), three special care units (Medical Intensive Care Unit, Neonatal Intensive Care Unit and Surgical recovery Room), five clinics (Eye, Anti-retro viral Treatment, Dental, TB and MDR-TB clinics) and 200 inpatient beds. The current study was carried out specifically at the surgical department and surgical recovery unit of YGH (54).

The third study area was Dilla University Teaching Referral Hospital (DRH), located in Dilla town. Dilla town is the administrative center of the Gedeo Zone in the SNNPR 360 km South of Addis Ababa and 90 km from the capital city of the regional state, Hawassa.

4.2 Study Design

Hospital based prospective study design was conducted for a period of three months from May 01 to August 01, 2018

4.3 Study Population

All patients newly admitted to the surgery ward of Hawassa, Yirgalem and Dilla referral hospital during the study period was our source population. Among these, those patients presented with acute abdomen due to any type of gastrointestinal obstruction and fulfil the inclusion criteria and volunteer to participate were enumerated prospectively as study subjects and followed for three months during the course of their management and till discharge from the hospital with their ultimate management outcomes for those patients finished their management during the study periods.

4.4 Eligibility Criteria

Inclusion criteria

- ✚ All patients presented to Surgery unit of study area with gastrointestinal obstruction during the months of May to August, 2018, regardless their age and gender
- ✚ Patients consented for participation into the study

Exclusion criteria

- ✚ Patients who or patients for whom the next kin refuse to consent for participation will be excluded from the study.
- ✚ Participants who already started management in other hospital and came to the study hospitals for check-up were excluded from the study.
- ✚ Patients who were severely ill due to other co morbid medical illnesses

4.5 Sample Size and Sampling Technique

Sample size was not determined initially. Rather, all gastrointestinal obstruction cases admitted at the study hospitals during the three months period stated above were randomly approached and requested for their consent to participate in the study. After their consents were obtained, the patients were evaluated for eligibility to be enrolled into the study. Nearly all patients admitted at the emergency surgery ward for acute abdomen gave their consent to

participate. However, based on the inclusion criteria we recruited only those cases with confirmed gastrointestinal obstruction and followed during their treatment at the hospital till discharge. Therefore, our sampling technique was non-probability purposive sampling based on availability. This is a convenience sampling method, in which the study subjects were chosen from the population using non-random methods. Accordingly, 156 obstructive cases were found eligible and included in this study.

4.6 Data Collection Procedure

The data was collected from three purposively selected hospitals using structured checklist adapted from different literatures in English language and translated to Amharic. The tool consisted of four major areas: socio-demographic, clinical variables, management options and treatment outcome (Annex-3). All data necessary for achieving the intended goal of the study that is to assess the incidence, types, clinical causes, associated factors and management outcomes of gastrointestinal obstruction was collected. The data collection was carried out by the principal investigator and three trained data collectors and one data collector supervisor, who are BSc nurses and fluently speak, read and write the local languages. The data collectors and the supervisor were trained on the data collection process and about the objectives of the study, before starting the actual data collection.

4.7 Participants Enumeration and Follow-Up

Patients initially identified from admission logbooks of surgical wards and Operation Theatres with already confirmed diagnosis of GIO or those admitted with acute abdomen and to be confirmed later for gut obstruction was approached and requested for participation. After explaining about the study objectives for the participants, informed written consent was obtained from each patient or from his/her nearest kin [Annex-1 & 2]. Patients consented for participation was asked for their condition and prognosis. The diagnosis of gastrointestinal obstruction was confirmed on the basis of detailed clinical history, physical examination, plain x-ray and/or ultrasound abdomen, after verified at operation the confirmation of GIO, patients was followed during the entire hospital stay for the post management and/or postoperative course till discharge or death. The ultimate treatment outcome was classified into favourable (recovered and uneventful post management course) and unfavourable outcome (death and eventful with complication). Data collection was carried out for three months from May to August, 2018.

4.8. Study Variables

4.8.1 The dependant variables

Spectrum of gastrointestinal obstruction and its management outcome was the dependent variable under study.

4.8.2 Independent variables

- ✓ Socio-demographic and other patient related factors like age, sex, residence,
- ✓ Presenting symptoms
- ✓ Time lapsed from onset to admission
- ✓ Disease-related manifestations
- ✓ Previous history of surgeries
- ✓ Time lapsed from admission to clinical management
- ✓ The type of clinical management undergone
- ✓ Intra-operative findings
- ✓ Post-operative complications
- ✓ Duration of hospital stay after commencement of treatment

4.9. Operational Definitions

- **Spectrum of diseases:** refers to the incidence, causes, anatomical sites, disease related manifestations and management options of gastrointestinal obstruction.
- **Gastrointestinal obstruction:** obstruction that occur in the gastric outlet, small intestine and large intestine
- **management out comes:** is the treatment out come after management it classified as relieved, complicated and death
 - **Favourable outcome:** patient characteristic with no any type of complication until discharge and relieved.
 - **Unfavourable outcome:** Patient's characteristic with any type of complication, death or both after the management has undergone.
- **Patients resent mental status:** this is to know whether the patients have previous or recent the history of psychiatric cases.
- **Intra operative procedure:** is the type of surgery performed.
- **Post-operative complication:** the complication due to different causes after operation underwent

- **Intra operative finding:** structure that observed when the abdomen was opened during surgery that may be intussusception, gangrene and etc.
- **Reason for admission:** this is the sign and symptoms shown in patients before hospital admission that may be vomiting, abdominal pain, abdominal distension and etc.
- **Exploratory laparotomy;** abdominal surgery that performed without knowing the pathology.
- **Rural;** patients who comes from outside the study area of the town.
- **Urban;** patients comes from the town of the study area.

4.10. Statistical Data Analysis

The collected data was merged, coded, cleaned and entered into Epi Data 3.1 version and then exported to the IBM SPSS Software version 20 for windows (29). The statistical analysis included descriptive statistics such as frequency and percentage. The management outcome and associated factors were analysed using binary logistic regression. First bivariate analysis was done and variables which had p-value <0.25 were selected for further multivariate analysis. Variables with a p-value < 0.05 at 95% CI were taken as statistically significant predictors of management outcome. Summarized results were presented in the form of frequency tables and different charts.

4.11. Data Quality Management

Data quality was assured by prior trained of data collectors and supervisors about the objective of the study and data collection procedure. In addition quality control performed with daily checking by data collector supervisor and principal investigator.

4.12. Ethical consideration

The ethical clearance was obtained from Jimma university ethical review board. Then given to the study area and the medical directors of the three referral hospitals. And they send to the surgery ward head office then the surgery ward head send the message for the nurse head of the surgery ward after this process and get permission from the study area the data collection was started. All study participants were informed about the objective of the study and their informed consent was obtained. Additionally, confidentiality and privacy of the patient information was seriously kept.

CHAPTER FIVE RESULTS

5.1 Socio-demographic Characteristics of the study participants

In this prospective study conducted over three months from May 01 to August 01, 2018 at three purposively selected referral hospitals found in SNNPR, Southern Ethiopia namely Hawassa referral hospital (HRH), Yirgalem General Hospital (YGH) and Dilla Referral Hospitals (DRH), a total of 156 patients (96 male and 60 female) with confirmed GI obstruction were included. The male to female sex ratio of the cases was 1.6:1. The majority of the study patients, 89/156 (57.1%) was from HRH; while 67 (42.9%) cases were from Yirgalem (33 cases, 21.3%) and Dilla (34 cases, 21.6%) hospitals together. Sociodemographic characteristics of the study patients were given in Table 1. As shown in the Table, the age ranged from 2 to 80 years, and 14 (9.0%) subjects were under 13 children. The most affected age groups were 25–34 with 36 (23.1%) cases, and 35–44 years with 59 (37.8%) subjects. The mean age was 34.1 ± 13.8 years. The urban population was more than rural population which was 82 (52.6%) and 74 (47.4%) respectively.

With regard to the educational status of the patients, read and write only and secondary school and above was 51 (32.7%) and 47 (30.1%) respectively. The occupational status of the patients was governmental work and farming in 36 (23.1%) subjects for each and merchant and daily labourers each holds 24 (15.4%) cases. The distance from health facility was mostly less than 5 km for 116 (74.35%) patients, while 34 (21.8%) subjects travelled more than 10 km (Table 1).

5.2 Anatomical Types of GI Obstructions and their Incidence

With regard to the incidence and anatomical types of GI obstructions, 62 (39.7%) subjects were diagnosed with large bowel obstruction (LBO), 52 (33.3%) were with small bowel obstruction (SBO), and the remaining 42 (26.9%) subjects had gastric outlet obstruction (GOO). The incidence and types of gut obstruction in this study was shown in Figure 2.

Table 1. Socio-demographic characteristics of gastrointestinal obstruction cases, 2018.

Variables	Categories	Frequency (%)
Sex	Male	96 (61.5)
	Female	60 (38.5)
Age	2-12	14 (9.0)
	13-24	16 (10.3)
	25-34	36 (23.1)
	35-44	59 (37.8)
	45 and older	31 (19.9)
Residence	Urban	82 (52)
	Rural	74 (47.4)
Educational level	Cannot read and write	31 (19.9)
	Read and write only	51 (32.7)
	Primary school	27 (17.3)
	Secondary school	47 (30.1)
Occupational status	Governmental worker	36 (23.1)
	Farmer	36 (23.1)
	Merchant	24 (15.4)
	Daily labourer	24 (15.4)
	Student	27 (17.3)
	Other	9 (5.8)
Income of the patient (Ethiopian Birr)	No income	30 (19.2)
	Under 1000	34 (21.8)
	1001-2000	38 (24.4)
	2001-3000	16 (10.3)
	3001-4000	12 (7.7)
	4001 and over	26(16.7)
Distance from health facility	<5 km	116(74.35)
	5-10 km	13(8.33)
	>10 km	34(21.79)
Patient recent mental status	Normal	149(95.5)
	Abnormal	4(2.6)
	Unknown	3(1.9)
Study town	Hawassa	89(57.1)
	Yirgalem	33(21)
	Dilla	34(21)

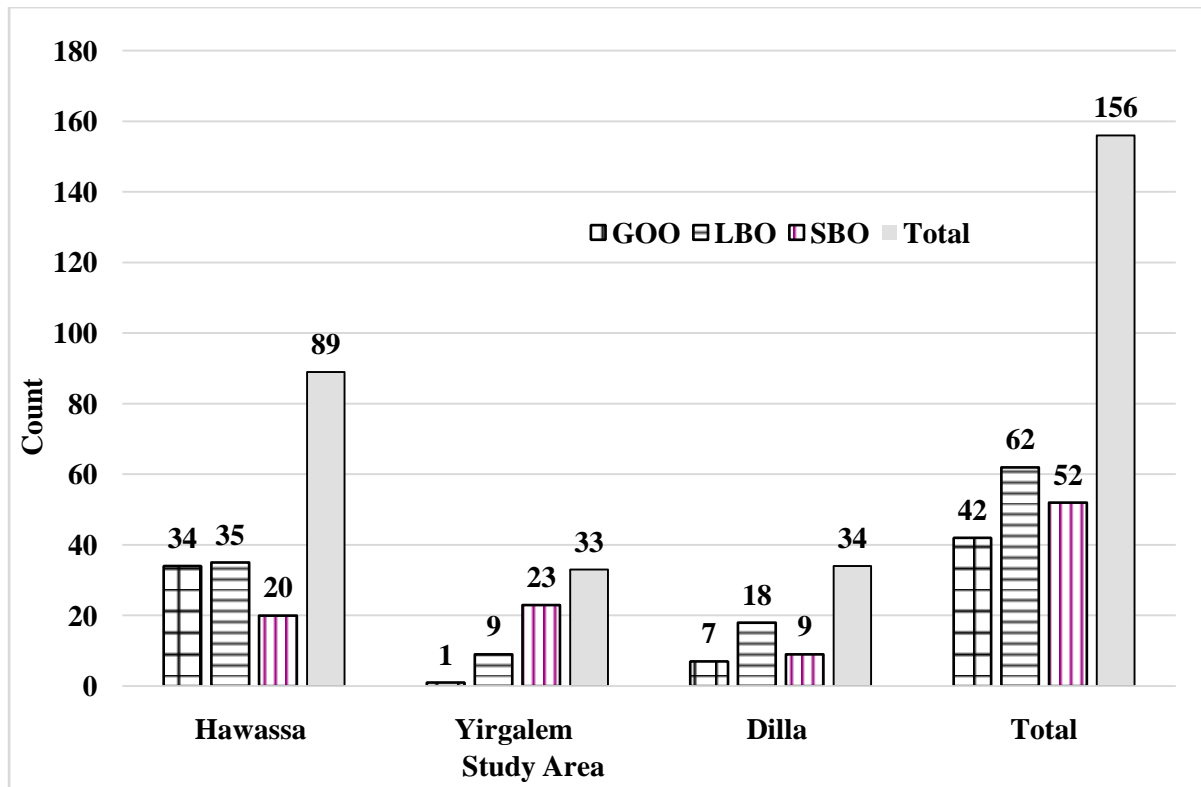


Figure 2 Incidence and Types of gut obstruction at three governmental hospitals in Southern Ethiopia. May-August 2018

5.3. Cardinal signs, symptoms and clinical conditions at presentation

The duration between onset of symptoms and presentation to hospital varied extensively, ranging from one to 21 days. Nonetheless, many of the patients studied (almost 61%) had presentation to the hospitals within 24 hrs, as shown in Table 2. The chief complaints were similar for most of the patients. Abdominal pain 151(96.8%), vomiting 143(91.7%), abdominal distension 120(76.9%), and constipation 117(75.0%) were the most frequently reported sign and symptoms of patients at presentation to the hospital.

With regard to the probable causes of gastrointestinal obstruction, clinical causes such as volvulus (24.4), bile reflux (21.8%) and adhesion (15.4%) were the highest percentage among others. For obstructions pertaining to benign causes, the highest percentage was peptic ulcer (7.1%) and hyper trophic pyloric stenosis (7.1%), followed by benign tumour (5.8%). The probable malignant cause was cancer 15(9.6), including gastric cancer 7(4.4%) and carcinoma of colon 11(7.1%). The common diagnostic tools used for the confirmation of the diagnosis were x-ray in 55.1% and ultrasound in 40.4% (table 2). Thirty-three patients (21.2%) had previous history of surgery among those 18(11.5%) cases were adhesiolysis and appendectomy in 8(5.1%) and other abdominal operations were in 7(4.2%) subjects.

Table 2: The cardinal sign and symptoms and clinical condition of gastro intestinal obstruction at three hospitals in SNNPR, Southern Ethiopia, 2018.

Variables	Categories	Frequency (%)	
From onset of symptoms to admission	Within 24 hrs	85 (54.5)	
	Above 24 hrs	71 (45.5)	
Reason for admission	Abdominal pain	151 (96.8)	
	Constipation	117 (75.0)	
	Abdominal distension	120 (76.9)	
	Altered bowel habit	29 (18.6)	
Clinical causes	Adhesion	24 (15.4)	
	Volvulus	38 (24.4)	
	Stricture	15 (9.6)	
	Abdominal parasites	28 (17)	
	Accidental external traumatic injury	10 (6.4)	
	Gastro-oesophageal reflux	27 (17.3)	
	Bile reflux	34 (21.8)	
	Others*	14 (9.1)	
	Benign causes	Benign tumour	9(5oi.8)
		Peptic ulcer	11(7.1)
Hypertrophic pyloric stenosis		11(7.1)	
Others**		7(4.2)	
Malignant causes	Cancer	18(11.5)	
	Carcinoma of colon	11(7.1)	
	Gastric cancer	7(4.4)	
Diagnostic tool used for diagnosis	x-ray	86(55.1)	
	Ultrasound	63(40.4)	
	Others***	7(4.2)	
Previous history of surgery	Abdominal operation	7(4.5)	
	Adhesiolysis	18(11.5)	
	Appendectomy	8(5.1)	

*multi factors other than listed, *** CT-scan, and etc

5.4. Treatment Options Given to the Patients and Clinical Findings

The clinical management, intra-operative procedures, findings and the ultimate treatment outcome of the gut obstruction cases studies was given in Table 3. As shown, in almost 61% of the patients, clinical management was commenced immediately within 24 hrs. The most common clinical management underwent was surgical intervention in 144 (92.3%) subjects. The remaining 12 cases (7.7%) were managed conservatively. Most frequent intraoperative

procedures underwent were exploratory laparotomy (42.3%), followed by therapeutic laparotomy which are resection and ostomy and resection and anastomosis in 28.8% and 27%, respectively (Table 3). Among others, adhesiolysis was performed in 24(15.4%) subjects, and the least frequented procedures were gastric polyp excision (1.3%) and stricturoplasty (1.3%).

The intraoperative findings recorded in descending grade of frequency include viable sigmoid volvulus (18.9%), intussusceptions (17.9%), adhesion and band (15.4%), and viable small bowel volvulus (14.1%). Other minor findings were gangrenous small bowel volvulus (11.5%), gangrenous sigmoid volvulus (6.4), colonic cancer 11(7.1%), ileo-sigmoidal knotting (14.7%) (Table 3).

Table 3: Treatment Options given to the Patients and clinical findings of gut obstruction cases at three hospitals in SNNPR, southern Ethiopia, 2018

Variable	Category	Frequency (%)
Duration		
Time duration from admission to commencement of treatment	Within 24 hrs	95(60.9)
	Above 24 hrs	61(39.1)
Type of treatment	Conservatively	12(7.7)
	Surgically	144(92.3)
Type of intra-operative procedure performed	Adhesiolysis	24(15.4)
	Resection and anastomosis	43(27)
	Hemi colectomy	14(9.0)
	Colostomy and hernia repair	12(7.7)
	Gastrostomy	7(4.5)
	Gastro-jejunostomy	6(3.8)
	Exploratory –laparotomy	66(42.3)
	Other*	7(4.2)
The intra operative finding	Intussusceptions	28(17.9)
	Viable sigmoid volvulus	29(18.6)
	Adhesion and band	24(15.4)
	Viable small bowel volvulus	22(14.1)
	Gangrenous SBV	18(11.5)
	Gangrenous sigmoid Volvulus	10(6.4)
	Colonic cancer	11(7.1)
	Ileo-sigmoidal knotting	23(14.7)
Others**	5(3.2)	

*stricturoplasty, herniorhappy and chemotherapy **Fecal impaction, Meckel's diverticulitis

5.5. Treatment Outcome and Post-treatment Complications

The ultimate management outcome of each patient was evaluated at the end of clinical management. Exit interview and/or review of discharge summary of the medical records were conducted. The Data collected at this time included the end treatment outcome (relieved, complicated and death), date and time of hospital discharge or death, and post-treatment complications, if there is any. The length of hospital stay was then deducted by determining the time range (completed days) between the recorded date of admission and date of discharge from the hospitals. Accordingly, complete data on length of hospital stay and ultimate management outcome was obtained for 150 subjects, indicating 96.2% response rate. This is because six patients were entered into the study around the last days of the study period so their end management outcome and length of hospital stay were not determined.

Length of hospital stay ranged from 3 to 24 days, with a mean (\pm SD) and median of 6.8 (\pm 2.9) and 6.0 (5, 8) days. The interquartile range (IQR) of the hospital stay was between 5 and 8 days, indicating the middle half of the study population stayed at the hospital for 5-8 days since admission. One hundred and four (66.7%) subjects were treated for less than 7 days, with a favourable prognosis and discharged immediately. With regard to ultimate treatment outcome, majority were relived (88%) and the others were complicated and died 9.3% and 2.66%, respectively as shown in Table 4. The overall mortality rate was less than 3%, the rate of unfavourable outcome was 18/150, 12.0%. Among those with complicated prognosis, wound infection (8) was the highest and among those who died, death occurred postoperatively 3 (75%) and 1(25%) during waiting. Figure 3 shows the incidence and types of post-management complications stemmed in 18 (12%) subjects.

Table 4: Treatment outcome and length of hospital stay of study patients at three governmental hospitals in SNNPR, Southern Ethiopia, 2018.

Variable	Category	Frequency (%)
Ultimate management outcome	Relived	132(88.0)
	Complicated	14 (9.3)
	Complicated with death	4 (2.6)
Post-operative complication	None	120 (86)
	Wound infection	8 (5.7)
	Others*	10 (7.2)
Time of death occurred	Post operatively	3 (75.0)
	During waiting	1 (25.0)
Length of hospital stay	Unknown	6 (3.8)
	< 7 days	104 (66.7)
	\geq 7 days	46 (29.5)

*those shown in the figure 3

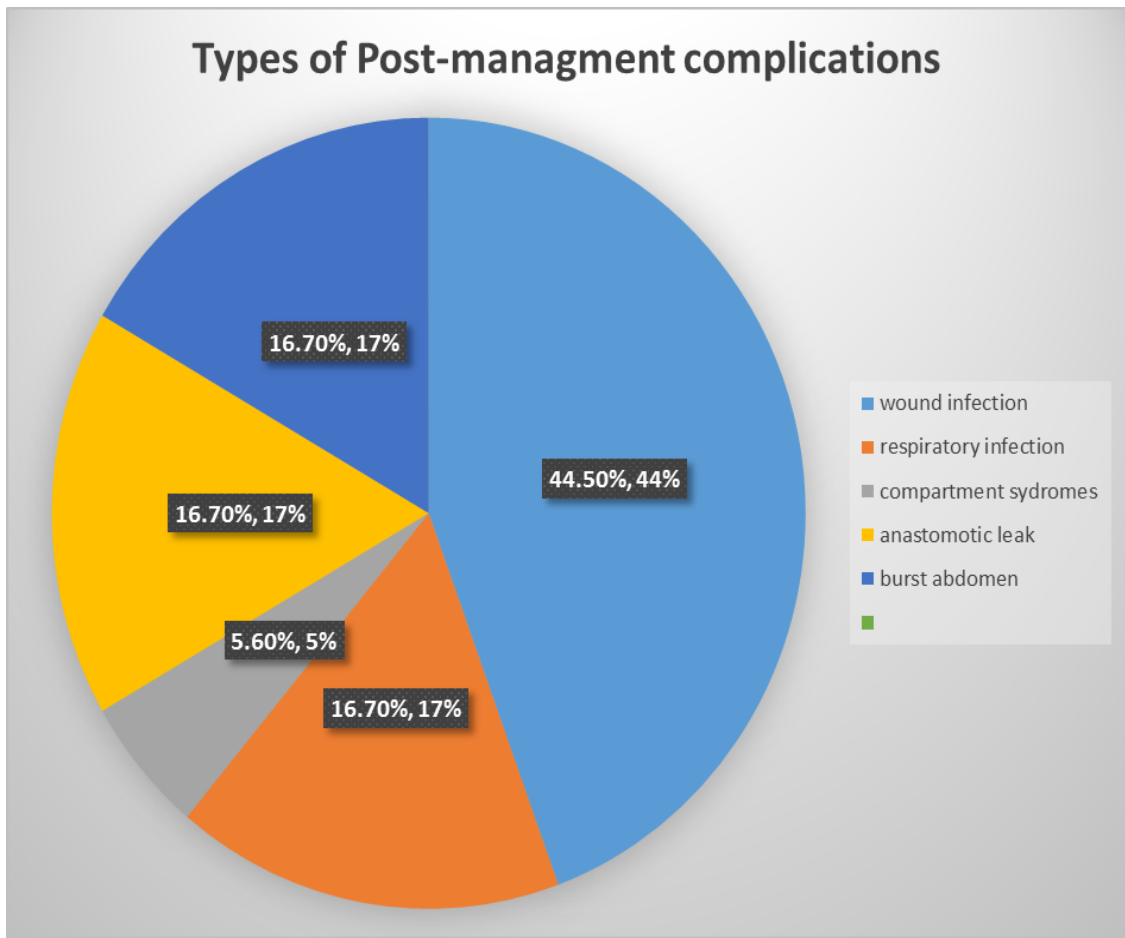


Figure 3 Incidence and Types of Post-tr 1: Incidence and Types of Post-treatment complications records in gut obstruction cases at three hospitals in SNNPR, Southern Ethiopia, 2018

5.6. Factors Associated with the Management Outcome of Gastrointestinal Obstruction

In bivariate analysis the variables which had p-value <0.25 are selected for multivariate analysis. These include age group between 35-44 years [COR= 0.182; 95% CI: 0.033 to 1.003] and length of illness since, below 24 hrs [COR= 0.038; 95% CI: 0.005 to 0.292]. From clinical variables which had p-value less than 0.25 with 95% CI were as follows: altered bowel habit [2.028, 0.657 to 6.263], small and large bowel obstruction [0.57, 0.105 to 3.086] and [3.059, 0.987 to 9.475] respectively. Adhesion [3.333, 1.112 to 9.996] benign tumour [4.40, 0.996 to 19.43], peptic ulcer [3.25, 0.777 to 13.587], and among intraoperative procedure performed variables which had p-value <0.25 are Adhesiolysis [3.333, 1.112 to 9.995], resection and anastomosis [3.059, 1.123 to 8.330] and exploratory laparotomy [2.37, 0.866 to 6.492] and among intra-operative finding and co morbidity adhesion and band [3.33, 1.112 to 9.995], gangrenous small bowel volvulus [5.25, 1.67 to 16.49] and previous surgery had [3.325, 0.595 to 18.566].

The above variables were then selected for multivariate analysis to see degree of association with the management outcome of gastro intestinal obstruction. The final predictors were considered statistically significant at p-value of < 0.05 and 95% CI of the adjusted odds ratio (AOR). The outcome the bivariate and multivariate logistic regression analyses were given in Table 5.

After Bivariate analysis variable exported to multivariate analysis and variable which had p-value <0.05 were taken as significantly associated with the management outcome of GIO. These are time since illness until admission above 24 hrs significantly associated with the management outcomes than those who admitted within 24 hrs [AOR= 0.034; 95% CI: 0.004 to 0.287; p=0.002]. Among the procedures performed to the patients, resection and anastomosis had marginal association, but not significant, with good management outcome [AOR= 3.032; 95% CI: 0.993 to 9.252; p=0.051]. With regard to the association between intraoperative findings and among the intraoperative findings and management outcome, patients with gangrenous small bowel volvulus had 4 times more likely to have unfavourable management outcome than other intra operative findings [AOR= 4.01; 95% CI: 1.445 to 15.118; p= 0.01].

Table 5: Bivariate and multivariate analysis of independent variables with management outcomes of gastrointestinal obstruction, 2018

Variables	Management outcome, No of cases		COR [95% CI]	P- value	AOR [95% CI]	P- Value
	Unfavourable	Favourable				
Age (year)						
Under 14	2	12	1	0.270	1	
15-24	3	13	0.867 [0.147, 5.123]	0.875	1.234 [0.071, 21.4]	0.885
25-34	6	30	1.200 [0.248, 5.818]	0.821	0.485 [0.058, 4.03]	0.503
35-44	2	57	1.040 [0.284, 3.808]	0.953	0.485 [0.058, 4.03]	0.503
45 and above	5	26	0.182 [0.033, 1.003]	0.05	0.171 [0.023, 1.300]	0.088
< 24 hrs illness	17	84	0.091 [0.005, 0.292]	0.002	.034 [.004, .287]	0.002
> 24 hrs illness	1	54	1		1	
Clinical causes						
Altered bowel habit reason for admission						
Yes	5	22	2.028 [0.657, 6.263]	0.21*	2.484 [0.711, 8.7]	0.154
No	13	116	1		1	
GOO	2	40	1	1	1	
SBO	11	41	0.570 [0.105, 3.086]	.514	.554 [.099, 3.094]	0.501
LBO	5	57	3.059 [0.987, 9.475]	.053*	1.429 [.378, 5.407]	0.599
Adhesion						
Yes	6	18	3.333 [1.112, 9.995]	0.32	2.98 [.800, 11.120]	.104
No	12	120	1		1	
Variables	Management outcome, No of cases		COR [95% CI]	P- value	AOR [95% CI]	P- Value
	Unfavourable	Favourable				
Benign tumour						
Yes	3	6	4.40 [0.996, 19.43]	0.056*	0.401 [0.001, 116.4]	.752
No	15	132	1		1	
Peptic ulcer						
Yes	3	8	3.25 [0.777, 13.587]	0.106	0.062 [.002, 2.438]	.138
No	15	130	1		1	
Length of hospital stay						
≤ 7 days	11	93	0.659 [0.238, 1.825]	0.422	0.461 [.144, 1.471]	.191
> 7 days	7	39	1		1	
Type of intra-operative procedure						
Adhesiolysis						
Yes	6	18	3.333 [1.112, 9.995]	0.032	2.539 [.734, 8.79]	.141
No	12	120	1		1	
Resection and anastomosis						
Yes	4	34	3.059 [1.123, 8.330]	0.029	3.032 [0.993, 9.25]	0.051
No	9	109	1		1	
Exploratory laparotomy						
Yes	11	55	2.371 [.866, 6.492]	0.093	1.37 [0.440, 4.27]	0.586
No	7	83	1		1	
Intraoperative findings						
Adhesion and band						
Yes	6	18	3.333 [1.112, 9.995]	0.032	2.87 [0.912, 9.04]	.072

No	12	120	1		1	
Gangrenous small bowel volvulus						
Yes	6	12	5.250 [1.671, 16.50]	0.005	4.67 [1.45, 15.12]	.010
No	16	122	1		1	
Previous surgery						
Yes	2	5	3.325[.595, 18.566]	0.171	4.29 [.692, 26.54]	.118
No	16	133	1		1	

CHAPTER SIX DISCUSSION

In this hospital based prospective study conducted over a three-month period, the incidence of GI obstruction at the three studied hospitals altogether was 156 patients. With regard to the anatomical types of the mechanical obstructions, 62 (39.7%) subjects were diagnosed with large bowel obstruction (LBO), 52 (33.3%) were with small bowel obstruction (SBO), and the remaining 42 (26.9%) subjects had gastric outlet obstruction (GOO). Literature evidence on the incidence of the entire gut obstruction in Ethiopia as well as around the world is scarce. The very few reports from Ethiopia deal with intestinal obstruction only (8, 46–49). Examples include those of, Soressa et.al (8), Demissie (41), Tegegne (44), Kotiso and Abdurahman (45), and Tsegaye et.al (46).

The proportion of intestinal obstruction captured in three months in the current study was 114 cases. Three years longitudinal study conducted in merely Adama Hospital, East Ethiopia reported 262 intestinal obstructions (8). Similarly, four years longitudinal study done in Hosanna Hospital, Southern Ethiopia indicated 235 cases of intestinal obstruction who were initially admitted for acute abdomen sickness. This result shows the magnitude and incidence of the GI obstruction in different parts of the country is comparable across the health facilities, with an estimated 7–10 admission of GI obstruction per month.

In the current study the duration between onset of symptoms and presentation to hospitals varied extensively, ranging from one to 21 days. The cardinal signs and symptoms of GI obstruction in this population were the usual abdominal distension, pain, constipation and vomiting. And these are not different from those indicated in other reports (7, 21). The pathology of gut obstruction varies in different geographic area. In this study the most common pathologies were volvulus, bile reflux, gastroesophageal reflux and adhesion in descending order. This observation was supported by a number of literatures (35–37). In Western societies, most of dynamic bowel obstructions are due to postoperative adhesions (65). Abdominal tuberculosis, although frequently reported as immediate cause of intestinal obstruction in Africa and Asia (3, 11), it was not recorded in the current study. Among others reasons, the difference could be due to lack of adequate facility and technology to catch such complex prognosis.

In this study the male to female sex ratio was 1.6:1 and the mean age was 34.1 ± 13.8 years, and the male out number female in all age groups. These findings are supported by similar

reports from India (10, 34) and Iran (4), but in contradiction with one descriptive prospective study report from Nigeria (7). In the Nigerian study, females are more affected than male. As study done in India the mean age of 33.2 years and according to that report, male are the most affected in all age group (10). A study from Somalia, Ethiopia's neighbour in South-eastern border, also support our findings, but slightly exceeds ours, by revealing the male supper dominancy among GI cases, in a 4:1 ratio (39). Although the root cause of such variation needs further studies, at least partially, it could be due to sample size difference and the population pyramid of the study areas.

In the present study the urban population were more than rural population this is because of the study areas were located in mainly urban sites. This is in contrast to a study report from India, in which the majority of patients 33(66%) were from rural area (36). In almost all patients, the reasons for hospital admission and the disease symptoms in the current population were abdominal pain 151 (97%), vomiting 143 (92%), constipation, abdominal distension and altered bowel habit in descending frequency. Similar results were reported in literatures from different countries in similar settings (34–40).

Most of the patients in the current study were treated surgically (92.3%) and only 7.7% of the study subjects were treated conservatively. This was because most patients arrived to the hospitals after sever stage of the obstruction. Similar results were indicated in a retrospective cross-sectional study conducted in Adama Hospital, East Ethiopia, indicating that about 94% of the patients were treated with surgical procedure (8). Among surgically treated groups, 9.4% had herniography with or without resection and anastomosis, 7.8% had adhesiolysis and band release, while 6.7% underwent segmental bowel resection. Rate of post-operative complication reported was 16 (8.9%) patients. Resection and ostomy, resection and anastomosis, and adhesiolysis were the commonest surgical procedures performed for most patients in this study. Similar results were reported by many researchers (34).

In the present study among the total of 156 patients 18 patients have previous adhesiolysis and 8 have previous history of appendectomy and 7 had previous abdominal surgery. DM and intestinal TB were the comorbid medical illnesses with frequency of 5 and 4 respectively. In many studies, previous surgery was the most common cause for adhesion and band (35).

In the current study, length of hospital stay ranged from 3 to 24 days, with a mean (\pm SD) of 6.8 (\pm 2.9) days. This is not different from other reports from Ethiopia and Africa (6–8).

With regard to ultimate treatment outcome, majority were relived (88%). The overall mortality rate was 2.7%, the rate of unfavourable outcome was 18/150, 12.0%. These results are in agreement with similar studies and the condition was not bad. The independent predictor of poor unfavourable outcome and mortality risk was late admission. All other patient characteristics did not affect the prognosis and outcome. This is similar with study from different countries (62—65). Since late presentation adversely affected patient outcome and increased morbidity and mortality, prevention strategies are undoubtedly essential to mitigate the condition. Among the procedures performed for the patients, only resection and anastomosis adversely affected the outcome, but not significantly. Among the intraoperative findings, gangrenous small bowel volvulus increased the likelihood of unfavourable management outcome four-times than other intraoperative findings. These results are similar with findings in different literature (8, 40).

Limitation of the Study

Although the data was collected from three study hospitals, separate analysis was not carried out due to small sample size. Rather, data from the three sites were merged and analysed as one sample. Therefore, inability to compare the study population across the study sites is the limitation of this study. Small sample size and hospital-based nature of the study also hinders the generalizability of the conclusions to large population or to the general community in Ethiopia or elsewhere.

CHAPTER SEVEN

CONCLUSION AND RECOMMENDATION

7.1. Conclusion

In this study the incidence of obstruction among the types of obstruction was large bowel obstruction which is relatively more than the other types. The most common pathology was volvulus, gastro-oesophageal reflux and adhesion and also gangrenous small bowel volvulus is significantly associated with the management outcomes Resection and anastomosis and adhesiolysis were frequently performed procedures. The most common management underwent were surgical management. The overall complication was 12.9% and mortality of 3 patients post operatively and 1 patient during waiting, with overall mortality rate of 2.7%.

7.2. Recommendation

From the result of the present study I recommended the following

- Further studies should reveal the real picture of GIT obstruction in Ethiopia with due emphasis on the root causes and predisposing factors so that its health and socioeconomic impact could be minimized.
- The post-operative treatment should have to be improved to decrease the complication and wound infection and also the mortality rate of the patients.
- Most of the patient was admitted to the hospital after severe sign and symptoms at emergency stage so most of patients underwent surgery to relieve, so as to decrease the surgical intervention the community should have to be educating about the primary sign and symptoms of gastrointestinal obstruction, to overcome late presentation due to time delay from onset of symptoms till admission and treatment.
- Exercising early diagnosis for different disease help to decrease the complication and mortality of the patients.
- Further prospective study and mega project as Ethiopia will be recommended to decrease the scarcity of literature with gastrointestinal obstruction.

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ANNEX 1: PARTICIPANT INFORMATION SHEET

Study Title: **SPECTRUM OF DISEASE AND TREATMENT OUTCOME OF GASTRO INTESTINAL OBSTRUCTION AT THREE GOVERNMENTAL REFERRAL HOSPITALS IN SOUTHERN ETHIOPIA: HOSPITAL BASED PROSPECTIVE STUDY**

Locality: Hawassa, Dilla and Yirgalem

Principal Investigator: Nigist Seyoum (B.Sc.) Contact phone number: +251-961-377478

Dear Participant,

My name is Nigist Seyoum, and M.Sc. candidate in Anatomy department of Jimma University. I am conducting a Thesis research on gastrointestinal tract (GIT) obstruction. Therefore, I am kindly inviting you to take part in this study which is aimed to determine the incidence, causes, clinical symptoms, management outcomes of GIT obstruction in Ethiopia. Currently, GIT obstruction is becoming a serious clinical problem worldwide, leading to emergency hospital admissions mainly due to acute abdomen with increased risk of mortality and reduced life expectancy. Nevertheless, scientific data on the incidence, the contributing factors, clinical symptoms and management outcomes of GIT obstruction in Ethiopia is scarce. It is due to this reason that this research is designed to circumvent this information gap. Therefore, the result of the study will have a great contribution towards the early identification and minimization of incidental death due to this condition by impacting health seeking behaviour of the community in the future. That is why I am inviting you to participate in the study. It is your full right to participate or not. If you do not want to take part, you don't have to give a reason, and it won't affect the care you receive. If you do want to take part now, but change your mind later, you can pull out of the study at any time.

If you agree to take part in this study, you will ask to sign the written Consent Form. You will give a copy of both the Participant Information Sheet and the Consent Form to keep if you need. For the purpose of this study, you are requested to provide your socio-demographic information, income, previous clinical and health history, and current symptoms. We also seek your permission in order to retrieve some of your clinical measures,

diagnostic tools and management interventions you received. Additionally, you will be asked to tell the distance and the time it took you to get the treatment from the current health facility.

All the information you provide will be kept confidential using a coding system. No potential risk or harm is expected to happen to you; no direct benefit is also going to be provided for your participation. Participants diagnosed with any form of severe health hazard will be referred for emergency management and/or for intensive care. Finally, I would like to thank you for your cooperation!

If you have any questions, concerns or complaints about the study at any stage, you can contact me, by the following address:

Nigist Seyoum (principal Investigator)

Telephone number: +251-961-377478

Email: mnigistseyoum@gmail.com

ANNEX 2: PARTICIPANT'S CONSENT FORM

Dear participant,

Please tick to indicate you consent to the following

I have read, or have had read to me in my first language, and I understand the Participant Information Sheet.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I have been given sufficient time to consider whether or not to participate in this study.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I am satisfied with the answers I have been given regarding the study and I have a copy of this consent form and information sheet.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study at any time without this affecting my medical care.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I consent to the research staff collecting and processing my information, including information about my health.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
If I decide to withdraw from the study, I agree that the information collected about me up to the point when I withdraw may continue to be processed.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I consent to my GP or current provider being informed about my participation in the study and of any significant abnormal results obtained during the study.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I agree to provide my clinical information from my medical record/chart.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I understand that my participation in this study is confidential and that no material, which could identify me personally, was used in any reports on this study.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I understand no direct benefit is given to me for my participation.	Yes <input type="checkbox"/>	No <input type="checkbox"/>

I understand my responsibilities as a study participant. Yes No

I wish to receive a summary of the results from the study. Yes No

Declaration by the participant: I hereby consent to take part in this study.

Name of the Patient/Patient's Next kin :

Signature: _____ Date: _____

Name of the witness _____

Signature: _____ Date: _____

ANNEX 3: DATA COLLECTION TOOLS

Name (Initials) of the Patient/Identification Code: _____

Date of Admission _____

Local Time at Admission _____

1.0. Socio-demographic and economic variables		
1.1	Age (years)	
1.2	Sex	1. Male 2. Female
1.3	Residence	1. Urban 2. Rural
1.4	Distance from JUMC	In km _____; OR in hours/minutes on foot _____
1.5	Educational status	1. Cannot read and write 2. Read and write only 3. Primary school complete 4. Secondary school and above
1.6	Occupational status	1 government worker 2 farmer 3 merchant 4 daily labourer 5 student 6 other specify _____
1.7	Income	_____ Birr/month OR _____ Birr/year
1.8	Reason for Admission, i.e. symptoms felt just before presentation	1. Abdominal pain 2. Vomiting 3. Constipation 4. Abdominal distension 5. Altered bowel habits, 6. GI bleeding 7. other, specify _____
1.9	Date and time when symptoms started	
1.10	Patient's recent mental status (Next kin of the patient was asked)	1. Normal 2. Abnormal 3. Unknown
2.0 Clinical variables		
2.2	Time lapsed from onset of symptoms to admission	_____ hours

2.3	Duration of illness until started clinical management	_____ hours, OR _____ days
2.4	Clinical Causes	<ol style="list-style-type: none"> 1. external hernias 2. adhesions 3. volvulus 4. Carcinoma of colon 5. obstructed abdominal wall hernias 6. stricture 7. Ileocecal tuberculosis 8. SMA thrombosis 9. Miscellaneous
2.5	Diagnostic tool used for confirmation of diagnosis	<ol style="list-style-type: none"> 1. Plain X-ray 2. ultrasound 3. CT-SCAN 4. Other technique, _____
2.6	Anatomical Types/sites of obstruction	<ol style="list-style-type: none"> 1. Esophageal 2. Stomach <ol style="list-style-type: none"> a. Pyloric stenosis b. Gastric ulcer c. Gastric outlet obstruction d. Other ----- 3. Small intestine <ol style="list-style-type: none"> a. Peptic ulcer b. Duodenal atresia c. Jejunum <ol style="list-style-type: none"> i. Jejunal perforation ii. Other, Specify _____ d. Ileum 4. Large intestine <ol style="list-style-type: none"> a. Ileocecal valve b. Appendix c. Colon d. Rectum e. Recto anal anomaly 5. Others, _____ Specify
3.0 Treatment Options given to the Patients and clinical findings		
3.1	Type of definitive treatment	<ol style="list-style-type: none"> 1. Conservative management 2. Surgical intervention
	If surgery underwent	<ul style="list-style-type: none"> • Date and Time of surgery: _____ • The professional performed the surgery <ol style="list-style-type: none"> 1. a consultant surgeon 2. a senior resident
3.2	The type of surgical	<ol style="list-style-type: none"> 1. Adhesiolysis 2. Resection & anastomosis

	procedure performed laparotomy after laparotomy	<ol style="list-style-type: none"> 3. Resection &ostomy 4. Hemi colectomy or Diversion colostomy 5. Hernia repair 6. Loop ileostomy 7. Stricturoplasty 8. Herniorrhaphy 9. Other
3.3	Intraoperative findings	<ol style="list-style-type: none"> 1. Intussusception 2. Perforation of _____ 3. Viable sigmoid volvulus 4. Adhesion & bands 5. Viable small bowel volvulus 6. Gangrenous SBV 7. Gangrenous sigmoid volvulus 8. Colon cancer 9. Iliosigmoidal knotting 10. Intestinal TB 11. Faecal impaction 12. Meckel's diverticulitis 13. Others, Specify
3.4	Type of post - operative complication	<ol style="list-style-type: none"> 1. None 2. Wound infection 3. Respiratory infection 4. Ostomy related complication 5. Sepsis 6. Compartment syndrome 7. Anastomotic leak 8. Burst abdomen 9. Other, specify 10. _____
3.5	Is there any previous history of abdominal operation	<ol style="list-style-type: none"> 1. Yes 2. No <p>If 'Yes' Specify the type(s) of previous abdominal surgery and date of operation.</p> <p>_____</p>
4.0 Outcome Variables and their Determinants		
4.1	Ultimate management outcome	<ol style="list-style-type: none"> 1. Relieved 2. Complicated (morbidity) 3. Died (mortality)
4.2	Death occurred	<ol style="list-style-type: none"> 1. During Waiting 2. During conservative management 3. During operation 4. Post operatively (If this, after how many hrs/minutes?)
4.3	Length of hospital stay	<ol style="list-style-type: none"> 4.3.1 From admission to start treatment _____ days 4.3.2 From treatment start to discharge _____ days

4.4	Previous history of Adhesion	1. Yes 2. No
4.5	Previous history of appendectomy	1. Yes 2. No
4.6	Record of co morbidities	1. DM 2. HTN 3. Neuropathy 4. Renal disease 5. Cardiac diseases 6. TB 7. HIV/AIDS 8. Others, Please specify _____

Date of Discharge _____

Local Time at Discharge _____

ምእራፍ 1-ናተያያዥመረጃዎች

የጥናቱ ርዕስ

በደቡባዊዉኢትዮጵያበሥነ-ጥናትዉሰተ-ዘዋዋሪሆስፒታሎችየጨጓራናየአንጀትመዘጋትመንስኤዎችእናየህክምናዉጤቶቻቸዉ

አካባቢ: ሀዋሳ, ዲላእናይርጋለም

ዋናተመራማሪ-ንግስትስዩም (BSc)

የስልክቁጥር: +251-961-377478

ውድተወካይ,

ስ

የጅማዩኒቨርሲቲየአናቶሚዲፓርትመንትውስጥእጨተወዳዳሪነኝ. በጂስትርስትራንስፖርት (GIT)

መዘጋትላይየተመሰረተጥናትማካሄድነዉ. ስለሆነምበኢትዮጵያውስጥየጂኦሎጂ / ቤትመከላከያውጤቶችን, መንስኤዎችን,

ክሊኒካዊምልክቶችእናየቁጥጥርስራዎችንለመለየትየተዘጋጀውበዚህጥናትውስጥእንዲሳተፉበደግነትእጋብዛችኋለሁ. በአሁኑጊዜየጂኦሎጂጉዳትበዓለምዙሪያአሳሳቢየክሊኒክችግርእየሆነበመምጣቱበአስቸኳይሆስፒታልምክንያትየሆስፒታልመግቢያበመድረሱምክንያትየመሞትንዕድልእናየህይወትንታኔንበመቀነሰላይገኛል. ይሁንእንጂየጂኦሎጂ (GIT)

እጥረትመከሰትበእርግዘቱ, በአደገኛሁኔታዎች,

በምርምርምልክቶችእናበአመራርላይየተደረጉውጤቶችንሳይንሳዊመረጃዎችማግኘትእጅግበጣምአናሳነዉ. ይህምምርምር ውጤትይህንንየመረጃክፍተትለመዘጋትየተዘጋጀነዉ.

ስለሆነምየጥናቱውጤትምለወደፊቱበማህበረሰቡላይየጤናፍላጎትባህሪላይተፅእኖበማድረግበቅድሚያአስቀድሞመታወቅና መቀነሰላይከፍተኛአስተዋፅኦይኖረዋል. በጥናቱውስጥእንዲሳተፉእየጋበዝኳችሁለዚህነዉ. ለመሳተፍሙሉመብትዎነዉ. ለመሳተፍካልፈለጉምክንያቱንእንዲሰጡአይገደዱም,

እናእርስዎበሚቀበሉትእንክብካቤላይምንምአይነትጽዕኖአይኖረውም. አሁንለመሳተፍከፈለጉ,

በኋላላይሐሳብዎንከቀየሩ, ጥናቱንበማንኛውምጊዜማንሳትይችላሉ.

በዚህጥናትለመሳተፍከተሰማሙ, የስምምነትቅጹንበመፈረምያጸድቃሉ. ለዚህጥናትዓላማ, ለማህበራዊ-ስነ-ህዝብመረጃዎ, የገቢዎ, የበፊቱክሊኒካዊናየጤናታሪክ, እናየአሁኑንምልክቶችለመጠቆምይጠየቃሉ.

በተጨማሪምእርስዎየተቀበሏቸውንአንዳንድክሊኒካዊእርምጃዎች, የምርመራመሳተፊዎችእናየአስተዳደርጣልቃገብነቶችለማውጣትየእርስዎንፈቃድእንፈልግዋለን. በተጨማሪም, አሁንካለውየጤናተቋማትህክምናውንለማግኘትእናለርቀትእናእርስዎየዕድሜ-በትንጊዜእንዲነግሩዎትተደርጓል.

የሚያቀርቡትመረጃበሙሉበዲጂታልኮድበመጠቀምሚስጥራዊተደርጓል. በአንተ/

ባንቺላይሊደርስየሚችልአደጋወይምጉዳትሊኖርአይችልም. ለእርስዎተሳትፎምንምቀጥተኛጥቅማጥቅሞችአይሰጥም.

ለማንኛውምዳይነትከባድየጤናአደጋምርመራየተደረገባቸውሰዎችለአስቸኳይአስተዳደርእና / ወይምለክፍተኛክትትልይጋለጣሉ.

በመጨረሻም ለርሱት-ብብርምስጋናዬንላቅርብ!

ስለጥናቱማንኛውምጥያቄ አሳሳቢሁኔታወይምቅሬታዎችካለዎት በሚከተለውአድራሻሊያገኙንይችላሉ-

ንግስትሰዩም(ዋናውተመራማሪ)የስልክቁጥር: + 251-961-377478

ኢሜይል: mnigistseyoum@gmail.com

ምእራፍሁለት:የአባልነትስምምነትቅጽ

ውድተወካይ,

አባክዎንለሚከተሉትእንደሚስማሙለማሳየትምልክትያድርጉ

በዚህ ጥናት ውስጥ ለመሳተፍ ወይም ላለመሳተፍ በቂ ጊዜ አግኝቻለሁ. አዎ አይ

ጥናቱን በተመለከተ በተሰጠኝን መልስ ረክቻለሁ እናም ይህን የስምምነት ቅጽ እና የመረጃ ወረቀት ቅጂ አለኝ. አዎ አይ

በዚህ ጥናት መሳተፍ በፈቃደኝነት (ምርጫዬ) አዎ አይ
እና ያለ እኔ የሕክምና እንክብካቤዬን በማይጎዳ መልኩ በማንኛውም ጊዜ ከምርመራዬ እንድትወጣ እረዳለሁ.

ስለ ጤንነቴ መረጃን ጨምሮ መረጃዎቼን የሚሰብኩ እና የሚያካሂዱ የምርመራ ባለሙያዎች ተስማምቼያለሁ. አዎ አይ

ከጥናቱ ለመውጣት ከወሰንኩ እኔን ወጣ እስከሚሰበስብ ወይም መረጃ እስከሚቀጥለው ድረስ ሊካሄድ እንደሚችል እስማማለሁ. አዎ አይ

በጥናቱ ውስጥ ስለተሳተፍዎት በጥናቱ ወቅት ስለተገኙት ስለተለመዱት ስለመደቡት ስለሙሉ ተስማምቻለሁ. አዎ አይ
A ስተባባሪ E ንዲረዱት ፈቃደኝኝ.

ክሊኒካዊ መረጃዬን ከህክምና መዝግብ / ሰንጠረዥ ለማቅረብ እስማማለሁ. አዎ አይ

በዚህ ጥናት ውስጥ ያለኝ ተሳትፎ በምስጢር እንደሚያዝና በግለሰብ ማንነት ሊገልጽልኝ የሚችል ምንምንገር እንደሌለተረድቼያለሁ. አዎ አይ

ለኔ ተሳትፎ ምንም ቀጥተኛ ጥቅም አልተሰጠኝም. አዎ አይ

ደየጥናት ተሳታፊ ያለኝን ኃላፊነቶች አረዳለሁ. አዎ አይ

የጥናቱ ሙሉ ተስማሚ ምርመራዎችን እፈልጋለሁ. አዎ አይ

በተሳታፊው የተሰጠ መግለጫ - በዚህ ጥናት ለመሳተፍ ፈቃደኝኝ.

የታካሚ / የታካሚ ቀጣይ ስም:;

ፊርማያ: _____ ቀን: _____

የምሥክርስም

ፊርማያ:

ቀን:

ምእራፍአንድ: የመረጃመሰብሰቢያመሳርያዎች

ስም: _____ መለያ ቁጥር _____

የመግቢያቀን _____

የመግቢያሰዓት _____

1.0. የማህበራዊእናየኢኮኖሚመረጃዎች		
1.1	ዕድሜ	
1.2	ጾታ	1 ወንድ 2. ሴት
1.3	የመኖሪያቦታ	1. ከተማ 2. ገጠር
1.4	ርቀትከሆስፒታሉ	በኪ/ሜ _____ ; ወይምበሰአት _____
1.5	የትምህርትሁኔታ	1. ማንበብናመጻፍአልችልም 2. አንብብእናግፍብቻ 3. የመጀመሪያደረጃትምህርትቤትተጠናቋል 4. ሁለተኛደረጃትምህርትቤትእናከዚያበላይ
1.6	የስራሁነታ	1 የመንግስትሠራተኛ 2 ገበሬ 3 ነጋዴ 4 የቀንሰራተኛ 5 ተማሪ 6 ሌላተለይቷል _____
1.7	ገቢ	በቀንወይምበወር _____ ብር
1.8	የመመዘገቢያምክንያቶች, ለምሳሌህመምምልክቶችከ መነሳታቸውበፊትተሰምቷቸዋል	1. ማስመለስ 2. መወርወር 3. የሆድመጠን 4. የተስተካከለየአካልብቃትእንቅስቃሴ, 5. የደምመፍሰስ

		6. ሌላ, ይግለጹ _____
1.9	ምልክቶቹጀመሩበትቀንእናሰዓት	_____
1.10	የታካሚውየቅርብጊዜአእምሮ(የታካሚውቀጣይአካል)	1. መደበኛ 2. ያልተለመደ 3. ያልታወቀ
2.0 የክሊኒካልመረጃዎች		
2.2	ምልክቱክታየበትእስከሆስፒታልእስከደርሱያለውጊዜ	_____ በሰዓትወይምበቀን
2.3	ህክምናእስከሚጀመርበትሰዓት	_____ በሰዓትወይም _____ በቀን
2.4	የክሊኒካልመንስኤዎች	1. ውጫዊአረያዎች 2. አዴሽን 3. ቮልቩለስ 4. የኮሎንካንሰር 5. የሆድድብልቅእጢዎችአብጠቱ 6. ጥብቅነት 7. ኢሊዎሴካልቲቢ 8. ኤስኤምኤቲርቦሲስ 9. የተለያዩ _____
2.5	የመመርመሪያመሳሪያዎች	1. ቅያሪኤክስሬይ 2. አልትራሳውንድ 3. ሲቲ-ስካን 4. ሌላዘዴ, _____
2.6	የአናቶሚክ/የመዘጋትቦታዎች	1. ጎሮሮላይ 2. ጨጌራላይ ሀ. ፓይሎሪክስቴኖሲስ

		<p>ለ. የጨጓራቁስለት</p> <p>ሐ. የጨጓራመወጪ ማዘጋት</p> <p>መ. ሌላ -----</p> <p>3. ትንሹአንጀት</p> <p>ሀ. ፔፕቲክአልሰር</p> <p>ለ. ደዱናልአትሬሽፍ</p> <p>ሐ. ጁጁነም</p> <p>ሌላ, ካለ _____</p> <p>4. ትልቅአንጀት</p> <p>ሀ. ኢሊአሴኬልገልቭ</p> <p>ለ. ትርፍአንጀት</p> <p>ሐ. ኮሎን</p> <p>መ. ሬክተም</p> <p>ሠ. ሪክቶአንአልአኖማሊ</p> <p>5. ሌሎች, _____ አጣራ</p>
3.0 ለታካሚዎች እና ለክሊኒካዊ ግኝቶች የተሰጡ የሕክምና አማራጮች		
3.1	የተሰጠው ህክምና	<p>1. ያለቀድጥና</p> <p>2. በቀድጥና</p>
	ቀድጥና የተሰራበት ትቀን እና ባለሙያው	<p>ቀድጥና የተሰራበት ቀን: _____</p> <p>ቀድጥና ወንድም ነው ባለሙያው</p> <p>1. አማካሪ ቀድሐኪም</p> <p>2. ሲኒየር ሬሲደንት</p>
3.2	የላፓራቶሚ አይነቶች	<p>1. አዴቭን ማስወገድ</p> <p>2. መቁረጥ እና ማያያዝ</p> <p>3. መቁረጥ እና አስቶሚ መስራት</p> <p>4. ሄሚኮሎክቶሚ ወይም የዳይቨርገር ንኮሎክቶሚ</p> <p>5. ሄርኒያን መመለስ</p> <p>6. ሎፕሊኒ አስቶሚ</p> <p>7. ስትሪክቸር ፕላስቲ</p> <p>8. ሄርኒአር ሃፒይ</p> <p>9. ለላካለ</p>
3.3	የቀድጥናው ግኝቶች	<p>1. ኢንቲሰሴፕሽን</p>

	ች	<ol style="list-style-type: none"> 2 _____ ቁስለት 3 ተመታታኝየሲግሞኢድመተታጠፍ 4 መጣበቅእናባንዶች 5 መጠነኛየትንሹአንጀትመተታጠፍ 6 ጋንግሪኒየስ SBV 7 ጋንግሪኒየስ SV 8 የኮሎንካንሰር 9 አይሎዝሲሞይዶልኖት-ቲንግ 10 የአንጀት-ቲቢ 11 የሙቀትሽግግር (Fecal impaction) 12 መክልሰዳይቨርቲኩላይ (Meckel's diverticulitis) 13 ሌሎች, ይግለጹ
3.4	ከድህረ-ህክምናበኋላየሚከሰቱትግሮች	<ol style="list-style-type: none"> 1. የለም 2. ቁስለት 3. የመተንፈሻአካላትግሮ 4. ከላልችሰቃይጋርየተያያዘችግር 5. ሴፕሲስ 6. የመሬትነቀርሳበሽታ (Compartment syndrome) 7. አናስቶሞሲስመፈታት 8. የሆድመነፋት 9. ሌላ, ይግለጹ -----
3.5	ከዚህበፊትየሆድቀዶጥገናአድርገውያውቃሉ	<ol style="list-style-type: none"> 1. አዎ 2. አይ <p>መልስዎ "አዎ" ከሆነየቀዶጥገናውንአይነት (ሎችን) ለይተውይግለጹ.</p> <p>_____</p>
4.0 የህክምናውጤቶችእናተጽዕኖች		
4.1	የመጨረሻውየማኔጅመንትውጤት	<ol style="list-style-type: none"> 1. ድኖዋል 2. ተወሳሰበዋል 3. ሞቱዋል
4.2	ሞትየተከሰተበትጊዜ	<ol style="list-style-type: none"> 1. በመጠበቅላይእያለ 2. ያለቀዶጥገናህክምናሲደረግለት 3. ቀዶህክምናላይእያለ 4. ከቀዶህክምናበዋላ 5. ሞትአልተከሰተም

4.3	በሆስፒታሉ የቆዩበት ጊዜ	1. ከገቡበት እስከ ህክምና ሰአት _____ ቀን 2. ከህክምና እስከ ሚዳኒክ ተጠቅሟል _____ ቀን
4.4	የበፊት የአዴሞሽን ታሪክ	1. አዎን 2. አይ
4.5	የበፊት የትርፍ አገልግሎት ተቀድሞ ገና ታሪክ	1. አዎን 2. አይ
4.6	ለሎች ተጨማሪ ማሪቦች ታዎች	1. ስኩዋር 2. HTN 3. ኒውሮፓዘ 4. የኩላሊት በሽታ 5. የልብ በሽታ 6. TB 7. HIV/AIDS 8. ለሎች ካሉ ዘርዘሩ ዋናው _____

የወጡበት ቀን _____

የወጡበት ሰዓት _____