

**ASSESSMENT OF ETIOLOGY AND TREATMENT OUTCOME
OF ADULT PATIENTS WITH LARGE BOWEL OBSTRUCTION
AT JIMMA UNIVERSITY MEDICAL CENTER, JANUARY 2022
JIMMA, ETHIOPIA**



**A THESIS SUBMITTED TO JIMMA UNIVERSITY MEDICAL CENTER
DEPARTMENT OF SURGERY IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR SPECIALITY CERTIFICATE IN GENERAL
SURGERY**

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JANUARY, 2022 JIMMA, ETHIOPIA

**JIMMA UNIVERSITY FACULTY OF MEDICAL SCIENCE
DEPARTMENT OF SURGERY**

**SIX MONTHS HOSPITAL BASED CROSS SECTIONAL
DESCRIPTIVE ANALYSIS OF ETIOLOGY AND TREATMENT
OUTCOME OF ADULT PATIENTS WITH LARGE BOWEL
OBSTRUCTION AT JIMMA UNIVERSITY MEDICAL CENTER
BETWEEN JULY 1,2021 TO DECEMBER 31, 2021 GC**

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ABSTRACT

Background: Intestinal obstruction (IO) occurs due to the failure of propagation of intestinal contents and classify into large bowel & small bowel obstruction. As a part of IO, complete LBO is an abdominal emergency, which has high morbidity, and mortality rates if not treated. Because of limited number of study in this area, I need to conduct the study on this topic.

Objective: To study the etiology and treatment outcome of adult patients with the diagnosis of large bowel obstruction admitted and managed during six months study period at jimma University medical center

Methods: Hospital-based cross-sectional study was used. Study subjects were all adult patients visiting jimma university medical center with diagnosis of large bowel obstruction, admitted, and managed. The study was conducted between July 1, 2021 to December 31, 2021 at JUMC. Source of data was from patient and medical records of patients who were admitted to surgical department with diagnosis of large bowel obstruction during stated study period. Trained data collectors collected data using a pre-tested questionnaire. Data was entered and analyzed using SPSS software (version 26). The result is presented using charts, tables, and graphs and described using texts.

Result: During stated study period total of 50 adult patients were diagnosed and managed for large bowel obstruction at JUMC. Of which 39 patients were males (78%), 11 patients were females (22%) with M: F ratio of 3.5:1. The most common cause of large bowel obstruction was colonic volvulus 25(50%), followed by colorectal tumor 13(26%). The ultimate treatment for all patients was surgery, primary resection and anastomosis was the most commonly performed procedure. Fifteen (30%) patients developed complications after surgery, Hospital acquired infection was the leading complication occurred in 8(30%) patients, followed by SSI 4 (8%) patients. Death occurred in 7 patients with a mortality rate of 14%. High mortality was due to presence of shock at presentation, gangrenous bowel and presence of post op complications.

Conclusion: Sigmoid volvulus was leading cause of LBO. High mortality is due to presence of shock at presentation, gangrenous bowel and presence of post op complications.

Keywords: Intestinal obstruction, large bowel obstruction, etiology, management,

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ABBREVIATIONS

A: Advisor

ACPO: Acute Colonic Pseudo-obstruction

CBC: complete blood count

CT: Computed Tomography

DC: Data Collector

ERB: Ethical Review Board

F: Female

HCT: Hematocrit

IO: Intestinal Obstruction

JUMC: Jimma University Medical Center

LBO: Large Bowel Obstruction

M: Male

MD: Medical Doctor

PI: Principal Investigator

RFT: Renal Function Test

SBO: Small Bowel Obstruction

SPSS: Statistical Package for Social Science

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CHAPTER ONE- INTRODUCTION

1.1 Background

Intestinal obstruction (IO) occurs due to the failure of aboral propagation of intestinal contents and may be due to a mechanical or functional pathology. Acute mechanical intestinal obstruction is one of the leading causes of surgical admissions in most emergency departments worldwide, the small bowel is involved in approximately 80 percent of cases of mechanical intestinal obstruction, while large bowel account 20%(1, 2)

As a part of (IO) complete large-bowel obstruction (LBO) is an abdominal surgical emergency which has high morbidity and mortality rates if not treated (1, 2). Approximately 70 percent of large bowel obstructions occur at or distal to transverse colon. Tumors at hepatic flexure are the least common. Tumors of the splenic flexure are more likely to result in obstructive symptoms. The most common causes of large bowel obstruction are neoplasm, colonic volvulus, hernias, bands, intussusceptions, fecal impaction, diverticulosis and inflammatory bowel disease. LBO may develop over a protracted period; the clinical presentation is often acute and includes abdominal pain, constipation or obstipation, and abdominal distension (3).

The marked distension of colon proximal to the level of obstruction leads to mucosal edema, bowel ischemia, and, if not treated, bowel infarction and perforation may occur. While the same principles of initial management of small-bowel obstruction (SBO) (attention to strangulation, hydration, and nasogastric suction) are used in LBOs, emergency surgery or colonoscopy is usually required to relieve the obstruction (4).

LBO is four to five times less frequent than SBO and the causes of LBO and SBO differ substantially (5). Colonic malignancy remains the most common cause of LBO (> 60%) (4, 6). Additional causes of LBO include entities such as diverticulitis, colonic volvulus, and adhesions. Colonic obstruction is most often seen in elderly individuals, as the aforementioned causes of obstruction are more common in advanced age groups. Of note, the etiology of LBO worldwide varies substantially as does the patient population affected; in Africa and India, volvulus is the primary cause of LBO (50%), and patients in these areas are usually young and healthy (7).

1.2 Statement of the problem

Intestinal obstruction is a potentially risky surgical emergency associated with high morbidity and mortality rates in both developed and developing world (2, 4). It also causes significant surgical side effects in hospital admissions and adversely affects the life of millions of people, across all age groups, with considerable direct and indirect economic impacts on the healthcare system and the affected patients (7).

In Africa, acute large bowel obstruction accounts for a great proportion of morbidity and mortality. Factors that might affect treatment outcome are age, gender, location of the lesion, presence of sepsis like peritonitis in late presentation, pre-operative organ failure. For that reason, an accurate pre-operative evaluation of severity factors might allow stratification of patients in term of their mortality risks and help in decision-making process for treatment (6, 7)

Ethiopia is one of the countries where large bowel obstruction is a major cause of morbidity and mortality. This study was aimed to assess the etiology and management outcome of large bowel obstruction at Jimma University Medical Center.

Documented researches are almost about intestinal obstruction including both small and large bowel obstructions. There were no studies done about large bowel obstruction in JUMC. Thus, this study was to fill this information gap and generate base-line information for physicians to know the cause and specific determinant factor, which affect the treatment outcome of patient with LBO. The finding or results obtained from this research could also be used as a baseline for researchers who are interested to do further researches in this area.

CHAPTER TWO- LITERATURE REVIEW

In western colon carcinoma is the most common cause of LBO (> 60% of cases), and mortality is high (10%–30%) in patients requiring emergency surgery (3, 8, 9). The two most frequent locations of obstruction due to colonic malignancy are the sigmoid colon and the splenic flexure (9). The most common site of perforation in LBO is not the site of the tumor but at the cecum, with a reported incidence of perforation of 3%–8% (10). The clinical manifestation of LBO from a colon malignancy depends on several factors, including the location of the tumor and competency of the ileocecal valve. Right-sided tumors with an incompetent ileocecal valve can mimic SBO. Left-sided malignancies cause diffuse distension of the colon up to the level of obstruction (8, 9)

Acute colonic volvulus accounts for approximately 10%–15% of LBO (3). Volvulus is defined as a twisting of the intestine upon itself that causes obstruction. If the twist is greater than 360°, the volvulus is unlikely to resolve without intervention. The symptoms of obstruction, severe abdominal pain, and distension, are due to the narrowing produced at the site of torsion. Vascular compromise at the site of volvulus leads to ischemia, necrosis, and perforation. Sigmoid volvulus is three to four times more common than cecal volvulus (60%–75% vs 25%–33%, respectively), and volvulus of the transverse colon and splenic flexure is very rare (< 1%) (4, 5). A major predisposing factor leading to a colonic volvulus is a mobile redundant colon on a mesentery and a fixed point about which the colon can twist. Sigmoid volvulus commonly occurs in the elderly, who have an elongated and chronically dilated sigmoid colon. The more proximal colon volvuli occur due to a congenital defect in the cecum or transverse colon mesentery, which makes these segments of the colon more mobile and prone to twisting (11). Patients with a large-bowel volvulus causing obstruction present with acute abdominal pain and abdominal distension. In the United States, the few available reports that investigated the incidence of colonic volvulus relative to other causes of bowel obstruction are either outdated or limited to large centers in specific regions. Colonic volvulus is thought to account for 3.4% of all cases of bowel obstructions in the United States and 10% to 50% in areas of higher endemicity, such as Africa,

Middle East, and South America (6, 7). This geographic variation is thought to be due to anatomical differences (8, 9); differences in diet, altitude, cultural factors and endemic infections (10, 11).

Although less common (10% of all cases of LBO), patients with acute diverticulitis can present with LBO due to bowel wall edema and pericolic inflammation (3). High-grade obstruction is less common in the setting of diverticulitis; more commonly, obstruction occurs in the setting of multiple episodes of diverticulitis, which causes a narrowing and stricture formation (5). Chronic diverticulitis can produce both LBO and a chronically dilated colon. While the most common location for obstructing diverticulitis is the sigmoid, LBO caused by diverticulitis may occur at any location in the colon and is not uncommon in the right colon in Asian countries (16).

Patients with sigmoid diverticulitis usually present with left lower quadrant pain, fever, a palpable left lower quadrant mass and constipation. If there is an accompanying LBO, they will also have abdominal distension. These symptoms may mimic a colon carcinoma—producing LBO. LBO due to the right colon or cecal diverticulitis may mimic a distal SBO, with dilatation of the small bowel upstream of the inflammation (16).

Intussusception accounts for only a small number (less than 1%–2%) of adult LBO cases. Demonstration of a lead point is found in more than 80% of adults (5). The most common cause of a colonic intussusception is a primary colon carcinoma (17). Besides, there are several benign lesions that can serve as lead points in colonic intussusception, the most common being adenomatous polyps and lipomas (18). Many other lesions have been reported to cause intussusception, including gastrointestinal stromal tumors, as well as a variety of appendiceal lesions, including the inverted appendiceal stump, endometriosis involving the appendix, and benign masses such as a mucocele (19, 20). Other reported causes of LBO due to intussusception include eosinophilic colitis, pseudomembranous colitis, and epiploic appendicitis (17, 21, 22).

Abdominal radiographs may show only evidence of bowel obstruction, and if the lesion is in the right colon, the findings may mimic a SBO. A contrast enema can identify the obstructing colonic mass and the classic “coil spring” appearance as the contrast material is trapped between

the intussusceptum and intussusciens. However, with signs and symptoms of a LBO, most patients will undergo an abdominal CT (23).

The most likely sites of colonic obstruction from intraluminal contents are the rectum (70%) and sigmoid colon (20%) (4,5). There are many reported causes of intraluminal contents resulting in colonic obstruction, including gallstones, enteroliths, intentionally inserted foreign body, medications, and illegal drugs. The most common cause is fecal impaction, a clinical entity occurring primarily in the elderly, chronically debilitated patients, and in those taking certain medications (3, 24). Although a considerably less common result of a hernia than a SBO, LBO can occur secondary to inguinal, femoral, umbilical, Spigelian, incisional, lumbar, and diaphragmatic hernias (5). The most common internal hernia to produce an LBO is the foramen of Winslow hernia, the condition in which small bowel and, in one-third of cases, the right colon herniate through the normal communication between the greater and lesser peritoneal cavities, between the free edge of the lesser omentum and the hepatoduodenal ligament (25). Abdominal radiographs will demonstrate findings of LBO. Most of these patients will undergo CT for definitive diagnosis, where colon will be found in a hernia with dilated proximal colon and decompressed distal colon (25).

Between 20% and 50% of patients with Crohn disease will have colonic involvement, and stricture formation of the large bowel occurs in 5%–17% of patients (26,27). It is important to exclude malignancy in these individuals as the risk of colon cancer is two to three times higher in patients with Crohn disease compared with age-matched standard populations (28). Stricture formation and obstruction is less common in ulcerative colitis and should raise suspicion of an underlying malignancy. Adhesions and external compression are a very rare cause of LBO. Adhesive bands causing LBO have been reported in the right, transverse, and sigmoid colon (5, 29, 30). Abdominal radiographs show a colonic obstruction, and contrast barium enema will demonstrate a short area of circumferential narrowing with intact mucosa. The large bowel can rarely become obstructed from external compression. This type of LBO is most commonly caused by adjacent masses. Sources of external compression are extensive and include endometriosis, lymphadenopathy, pancreatitis, intra-abdominal abscesses, mesenteric or colonic surface involvement of peritoneal carcinomatosis, and direct invasion from gynecologic or prostatic malignancies (30).

ACPO acute Colonic Pseudo-obstruction or (Ogilvie syndrome) is an important mimic of LBO was first described by Ogilvie in 1948 as a pseudo-obstruction secondary to interruption of sympathetic innervation of the colon (31). A number of etiologies have been implicated in causing colonic pseudo-obstruction. Although the exact pathophysiology is still unclear, the treatment with neostigmine is based on parasympathetic stimulation. This medication has been reported to show rapid resolution in more than 80% of ACPO patients (32). Treatment with lower endoscopic decompression is also very beneficial (33). ACPO is most common in male patients over 60 years of age, and most are already hospitalized with a severe illness. The symptoms of ACPO mimic those of LBO and include abdominal distension, pain, nausea, and vomiting. While they usually develop over 3 to 7 days, symptoms may occur more quickly. Abdominal tenderness, a common sign in the setting of LBO, is not a prominent feature of ACPO and its presence, especially in the presence of other signs of an acute abdomen, should prompt an immediate workup to exclude perforation (34).

Mortality is determined by the patient's overall medical condition and the presence of any comorbidity that may influence the patient's surgical risk. If large bowel obstruction is treated early, the outcome is generally good. Mortality is higher in patients who have developed bowel ischemia or perforation and those who present with shock. After surgical decompression, the prognosis is determined by the underlying disease. In general, overall mortality for large-bowel obstruction (is 20%, which increases to 40% if there is colonic perforation).

Conceptual Framework

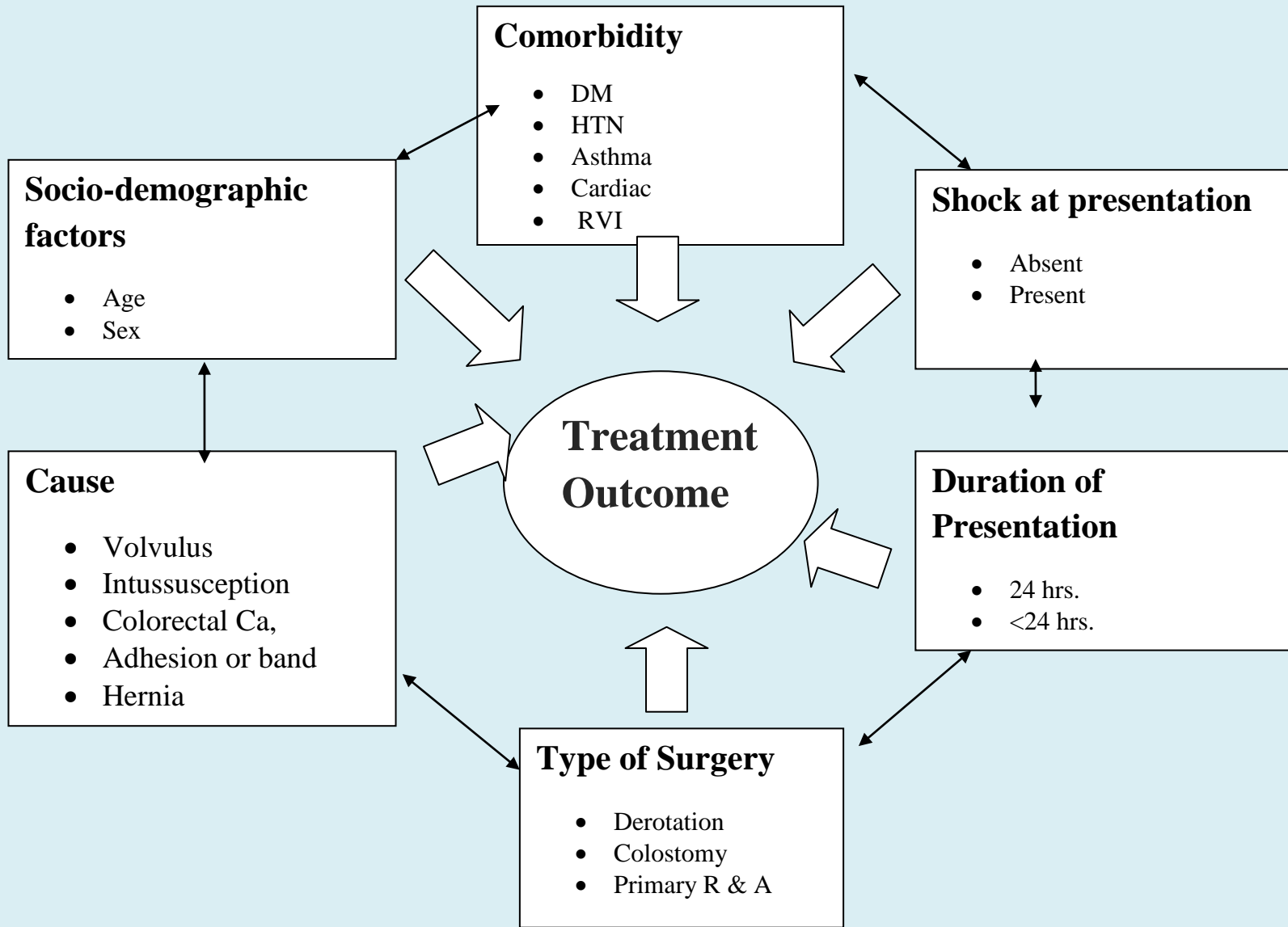


Figure 1 Conceptual frameworks for factor affecting treatment outcome of LBO (developed from different literature review)

CHAPTER THREE- OBJECTIVES

3.1 General objective:

- ★ To assess the etiology and treatment outcome of LBO at JUMC from July 1 to December 31 /2021, Jimma zone

3.2 Specific objectives:

- 1 To describe the sociodemographic characteristics of adult patients with large bowel obstruction visiting JUMC from July 1 to December 31 /2021, Jimma zone
- 2 To analyses common presentation of LBO at JUMC from July 1 to December 31 /2021, Jimma zone
- 3 To identify the common cause of LBO at JUMC from July 1 to December 31 /2021, Jimma zone
- 4 To evaluate the treatment outcome of LBO at JUMC from July 1 to December 31 /2021, Jimma zone

CHAPTER FOUR- METHODS AND MATERIALS

4.1 Study area and period

This study was carried out in JUMC, which is found in Jimma town, located 350km southwest from Addis Ababa. It becomes the only teaching and referral hospital in the south western part of the country. One of the universities in Ethiopia known for its pioneer in community based education. There are 10 specialty units (surgery, Internal medicine, GYN/OBS, Ophthalmology, Dermatology, Psychiatry, pediatrics, Maxillofacial, Emergency medicine and Anesthesia).surgery department is one of major specialty unit it has 189 beds, accounting for 28.3% of all beds available in the hospital & has 7 major operating tables for both elective and emergency cases

The study was carried out from July 1 to December 31 /2021, Jimma zone, at JUMC Jimma zone, Oromia region, Ethiopia.

4.2 Study design

This study was a hospital based cross sectional study which was conducted among all adult patients with the diagnosis of large bowel obstruction visiting JUMC during the study period from July 1 to December 31 /2021, Jimma zone, Jimma zone, Oromia region, Ethiopia.

4.3 Source and study population

The source population was all adult patients admitted to JUMC with the diagnosis of large bowel obstruction during the study period from July 1 to December 31 /2021, Jimma zone, Jimma zone, Oromia region, Ethiopia.

The study population was include all adult patients admitted to JUMC with the diagnosis of large bowel obstruction during the study period from July 1 to December 31 /2021, Jimma zone, Jimma zone, Oromia region, Ethiopia

4.4 Eligibility criteria

4.4.1 Inclusion criteria's

All adult patients admitted with diagnosis of LBO & managed at JUMC during the study period from period from July 1 to December 31 /2021,

4.4.2 Exclusion criteria's

-All adult patients with diagnosis of LBO visiting JUMC who were not volunteer to participate in the study

-Sigmoid volvulus patients who successfully managed by rectal tube deflation and subsequent surgery deferred either by patients or by physician for any reason.

-Pediatric patients <15 years of age

4.5 Sample size and sampling technique

All adult patients who visited JUMC with diagnosis of large bowel obstruction during the study period which starts from July 1 to December 31 /2021, Jimma zone, Oromia region, Ethiopia and meeting inclusion criteria included in this study

4.6 Study variables

4.6.1 Dependent variables

Outcome of large bowel obstructions

4.6.2 Independent variables

- Age
- Sex
- Etiology
- Comorbidity
- Duration of presentation
- Shock at presentation
- Type of surgery

4.7 Data collection instrument

Data was collected using a structured questionnaire on age, sex, address of the patient; presenting sign and symptoms of large bowel obstructions, duration of presenting symptoms, diagnostic tests, treatment given and outcome of the treatments. Complications that patients developed after procedures were also recorded.

The survey questionnaire was constructed in English but the interview part was interpreted to the local language of the participant by the data collector

The survey questionnaire has three parts

Part one -contain identification & sociodemographic characteristic

Part two -contain clinical presentation and Investigations

Part three -contain management and outcome

4.8 Data collection procedures

After having consent, patient was given a unique ID number that was used to identify him/her throughout the study time. Trained data collectors conducted data collection while the patient presented to JUMC surgical side with the diagnosis of LBO by interviewing and reviewing medical records of patients. Each questionnaire was given to the principal investigator while complete and finally, the questionnaire was compiled based on the ID number of the patient.

4.9 Data quality control measures

Data quality was controlled through continuous supervision during data collection. All completed data collection tools was examined for completeness and consistency during data management, storage and analysis. The data is entered and cleaned by principal investigator before analysis.

4.10 Data processing and analysis

The data will be coded, entered, cleaned, and analyzed using SPSS software (version 26) for Windows. Descriptive statistical analysis was conducted using frequencies and proportions. The results presented in numbers, ratios, tables and graphs. Descriptive statistical method was used to summarize data on sociodemographic and clinical presentation. The Pearson chi-square test was used for statistical analysis of relationship between outcome and factors affecting outcome. A P value of <0.05 was considered as statistically significant.

4.11 Operational definition

- ★ **Treatment outcome:**- Improvement: A patient who is discharged without death
- ★ **Complication-** post-operative patient who develop sepsis, multi-organ failure, wound dehiscence, hospital-acquired pneumonia, wound infection, anastomotic leak, colostomy prolapsed, colostomy necrosis
- ★ **Comorbidity:** A patient with LBO who has DM, HTN, asthma, RVI, cardiac disease, PTB

- ★ **Shock at presentation:** A patient with LBO whose SBP<90 at presentation
- ★ **Volvulus:** is a twisting or axial rotation of a portion of bowel about its mesentery (35)
- ★ **Intussusception:** is when one portion of the gut invaginates into an immediately adjacent segment (35)
- ★ **Illiosigmoid knotting:** when the ileum twist around the sigmoid colon or vice versa (35)
- ★ **Colostomy:** is an artificial opening made in the colon to divert feces and flatus outside the abdomen (35)
- ★ **Right hemicolectomy:** is used to remove a lesion in the right colon (removing cecum, ascending colon & part of the transverse colon) (35)
- ★ **Left hemicolectomy:** is used to remove lesion in the left colon (removing part of transverse colon, descending colon & sigmoid colon) (35)

4.12 Ethical consideration

Ethical approval was obtained from Institutional review board (IBR), Institute of Health Science Jimma University. After a brief explanation of the purpose and objectives of the study to every study, participant verbal consent was taken before data collection. All personal information obtained from study participants was coded to maintain confidentiality.

4.13 Dissemination of results

The final finding of this research will be submitted in hard and soft copy to Jimma University, Institutes of Health Faculty of Public Health Department Health Policy and Management, Research and Publication Office and library catalog. It will be disseminated to local authorities after approval of the department and effort will be made to publish.

Chapter Five - RESULT AND DISCUSSION

5.1 Result

5.1.1 Demographic characteristics

During six months study period a total of 58 adult patients with the diagnosis of large bowel obstruction visited JUMC of which 50 patients who were admitted and managed surgically are included in this study. The minimum age of patient 16 years and maximum was 80 years with a mean of 46.76 years (standard deviation (SD) \pm 15.06) years. In terms of sex 39 are males (78%), 11 patients are females (22%) with a ratio of M: F 3.5:1. The study revealed that 35 cases (70%) from Jimma zone and the rests are from surrounding Oromia and SNNP regions (see Table 1). Sixty four percent are farmer and 16% percent are merchant by occupation. Sixty percent are Muslim, 22% are orthodox & 18% are protestant by their religion. Seventy four percent are married and 16% are single.

Table1: sociodemographic characters patients with LBO at JUMC

Sociodemographic characteristics	Age ranges	Frequency	Percent
Age	15-25	4	8%
	26-35	7	14%
	36-45	17	34%
	46-55	6	12%
	56-65	13	26%
	>65	3	6%
	Total	50	100%
Sex	MALE	39	78%
	FEMALE	11	22%
	Total	50	100%
Address	Jimma zone	35	70%
	Bunno Beddele	3	6%
	Iluababor	3	6%
	Snp	9	18%
	Total	50	100%

5.1.2 Clinical Presentations

Most common presenting symptoms of patients with large bowel obstruction is abdominal pain which is present in 48 patients (96%) followed by obstipation and abdominal distention each presenting in 90% of patients (see table 2). Of twenty two patients with sigmoid volvulus 8 have previous episodes at least one attack successfully managed with rectal tube deflation, but only one patient from this group have gangrenous bowel at operation. Nine out of thirteen patients with colorectal cancer have at least one episodes of bleeding per rectum or weight loss within the past months. Generally, around 14% (7/50) of all patients have at least one episodes systolic blood pressure less than 90mmHg at admission (see table 3). Peritonitis is present in 34% (17/50) of patients (see table 4). Vast majority (66%) of patients present 72 hours later after onset of symptom with only minority (8%) present to hospital within the first 24 hours of symptom onset (see table 5). Comorbid medical conditions are identified in nearly quarter of patients the most common one is being hypertension (see table6 & fig.1). Average duration of hospital stay is 10.32 day; minimum is 1 day & maximum is 26days.

Table 2 presenting symptoms of LBO

Symptoms	Frequency	Percent
Abdominal Pain	48/50	96%
Vomiting	30/50	60%
Abdominal distention	45/50	90%
Obstipation	45/50	90%
Diarrhea	5/50	10%
Bleeding per rectum	18	36%

Table 3: Systolic blood pressure at admission

SBP	Frequency	Percent
≥ 90 mmHg	43	86%
< 90 mmHg	7	14%

Table 4: Peritonitis

Table 5: Duration of Presenting Illness

Duration Of Presenting Illness	Frequency	Percent
< 24 hrs	4	8%
24-72hrs	13	26%
more than 72 hrs	33	66%
Total	50	100%

Table 6: Comorbidity

Comorbidity	Frequency	Percent
No	37	74%
Yes	13	26%
Total	50	100%

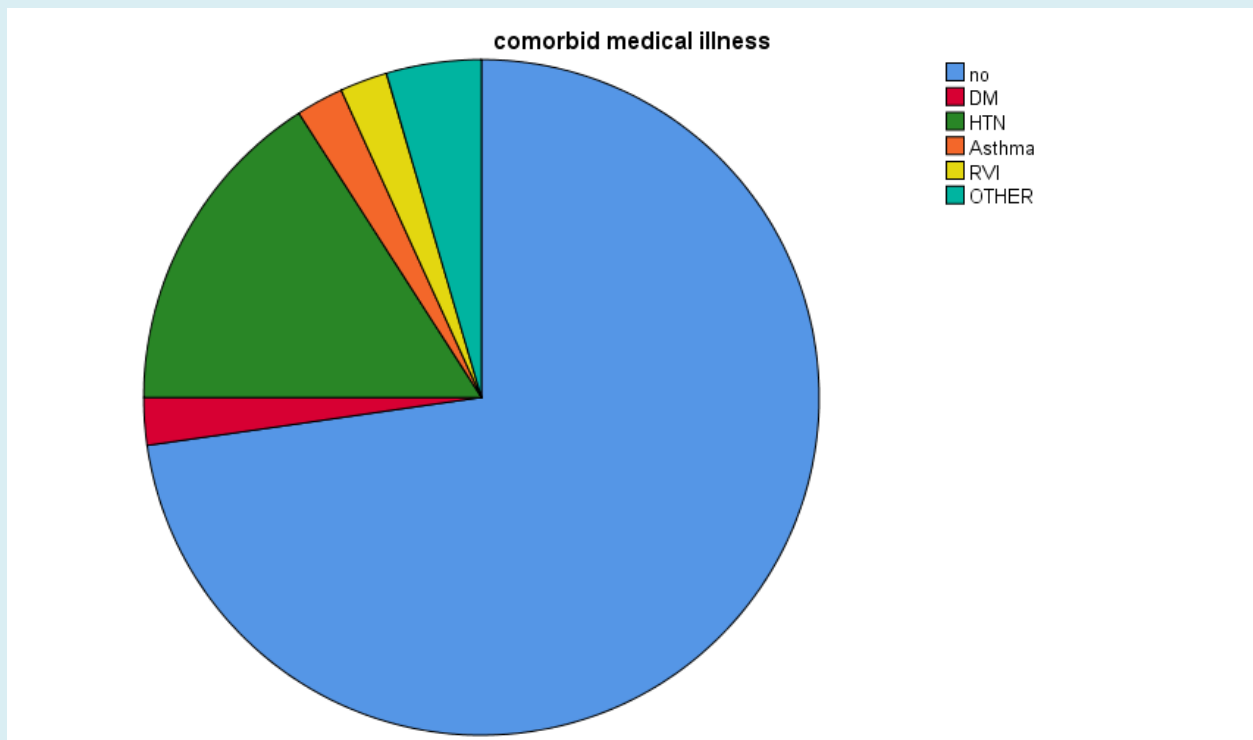


Fig.2 comorbid medical conditions

5.1.3 Laboratory investigations and imaging

All patients have CBC done at admission which revealed leukocytosis in 40% of patients & mild to severe anemia in 44% of patients(See table 7).Etiologically most patients (8/13) with underlying malignancy have mild anemia. Renal function tests were done for 47/50 (94%) patients of which it is deranged in 9/47 (19%) of patients (see 8). Eighty eight percent of patient have plain abdominal x ray done of which majority (66%) have features of sigmoid volvulus or LBO (see table 9).

Table 7: Complete blood count (CBC)

WBC	Leukocytosis	Frequency	Percent
	Present	20	40%
	Absent	30	60%
	Total	50	100%
HCT	Hematocrits	Frequency	Percent
	Normal	28	56%
	Mild Anemia	17	34%
	Moderate Anemia	4	8%
	Severe Anemia	1	2%
	Total	50	100%

Table 8: renal function test (RFT)

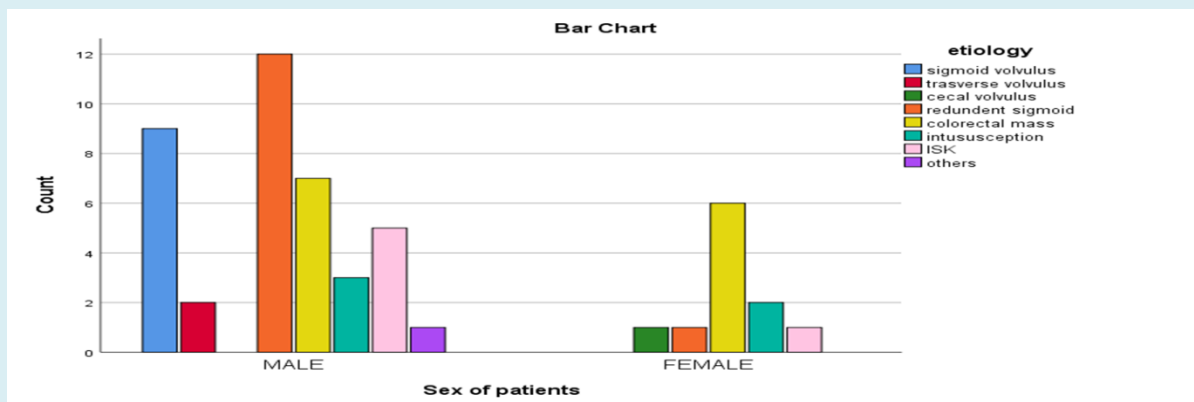
RFT	Frequency	Percent
Normal	38	76%
Deranged	9	18%
Not Done	3	6%
Total	50	100%

Table 9: Plain Abdominal x ray Features

Plain abdominal x ray features	Frequency	Percent
Not Done	6	12%
Non Diagnostic	1	2%
Small Bowel Feature	8	16%
Sigmoid Volvulus	21	42%
Mixed Small And Large	2	4%
LBO	12	24%
Total	50	100.0%

5.1.4 Etiology

Leading causes of large bowel obstruction is colonic volvulus 25 (50%), most commonly involved region of colon is sigmoid (44%) followed by transverse colon (4%) & cecum (2%) respectively. Colorectal neoplasm (26%) is second leading causes of large bowel obstructions most commonly involve recto sigmoid region. Ileo-sigmoid knotting (ISK) third leading causes (12%) followed by intussusception (10%) (See table 10).



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Fig 3: distributions of etiology across sex of patients

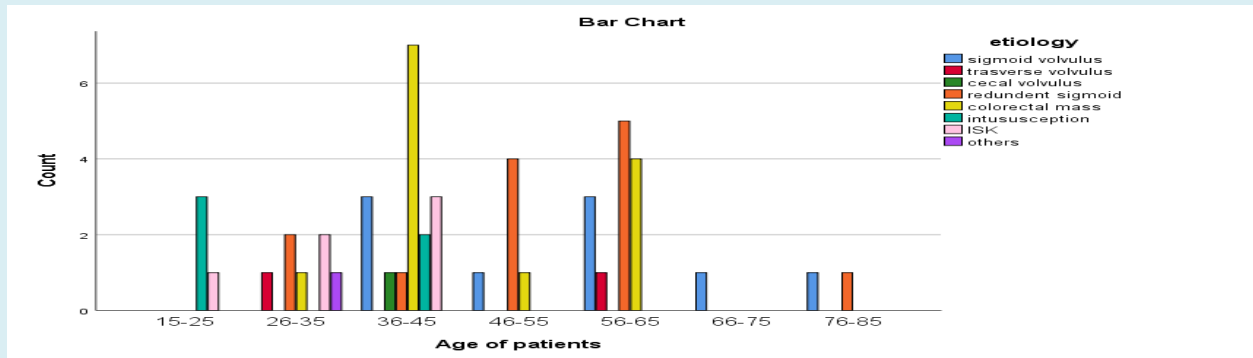


Fig 4: distributions of etiology across patient age

Table 10: Etiology of large bowel obstruction

Etiology		Frequency	Percent
Volvulus		25	50%
	Sigmoid volvulus	(9)	(18%)
	Transverse volvulus	(2)	(4%)
	Cecal volvulus	(1)	(2%)
	Redundant sigmoid	(13)	(26%)
Colorectal mass		13	26%
Intususception		5	10%
ISK		6	12%
Others		1	2%
Total		50	100%

5.1.5 Treatments

Majority of Patients with sigmoid volvulus and without peritonitis at presentation were initially managed successfully with rectal tube deflation and subsequently operated electively during the same admission (>50%). However those patients with peritonitis, failed rectal tube deflation and other underlying etiology were operated on emergency basis (see table 11). Most common procedure done resection and primary anastomosis all of which done on elective bases. For emergency operation the most commonly performed procedure is resection and stoma (see table 12). Sixteen percent (8/50) of patient have intraoperative hypotension (see fig.2). The bowel was gangrenous at operation in 16 patients (32%) (See table 13 below). Post-operative complications occur in 15 patients (30%), most common one is being HAI followed by SSI each occurring in 8 and 4 patients respectively (see fig.3 below).

Table 11: Management Type

Management type	Frequency	Percent
Rectal tube deflation with subsequent elective operation	13	26%
Failed rectal tube deflation operated on emergency	2	4%
Operated directly	35	70%
Total	50	100%

Table 12: Procedure Types

Procedure types	Frequency	Percent
Hartmann's procedure	10	20%
Resection and stoma	12	24%
Resection and primary anastomosis	13	26%

Hemicolectomy	6	12%
Derotation laparotomy	2	4%
Others	7	12%
Total	50	100%

Fig.2 intra-operative hypotension

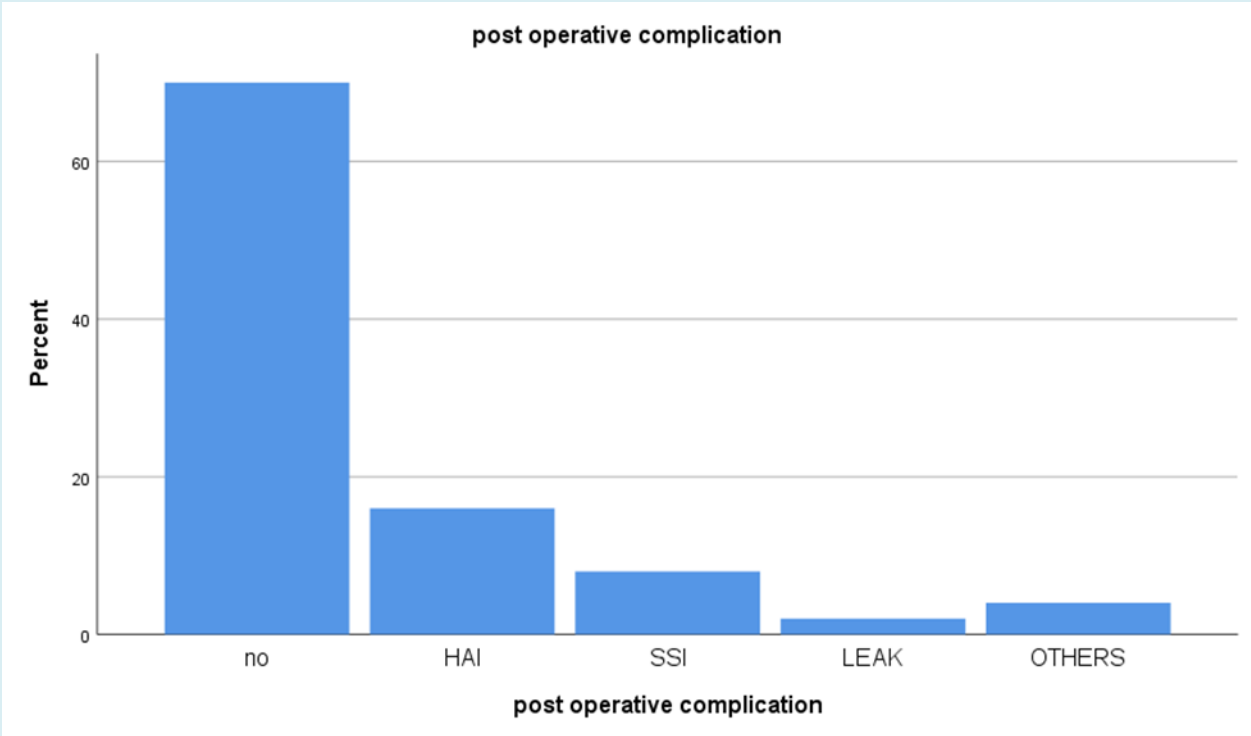


Fig.5 post-operative complications

Table 13: Intra-Operative Bowel Condition

Bowel condition	Frequency	Percent
Viable	34	66.7
Gangrenous	16	31.4
Total	50	98.0

5.1.6 Outcome and Factors associated with the outcomes

Of all fifty patients with large bowel obstruction managed surgically, 43 (86%) patients were improved and discharged whereas 7 (14%) patients were died in hospital. In this study certain predictors of in hospital mortality have been identified this includes presence of shock at presentation which is significantly associated with death Pearson chi-squares at (P value =0.018) (see fig.4). Likewise presence peritonitis/gangrenous bowel at (P value=0.024) (see fig.5), intraoperative hypotension at (P value=0.001) (see fig.6) and post-operative complications at (P value=0.001) (see fig.7). However others factors that appears to predict mortality in other study such as medical comorbidity, duration of presenting illness , underling etiology and ages appears weakly associated with mortality but significantly associated morbidity probably due to limited sample size which is main limitation this study .

Table : 14 outcome and factor that appears to affect outcome in this study

Variables		Outcome		Pearson Chi-Square	P value
		Improved	Died		
Shock	Present	4 (8%)	3(6%)	5.63	0.018
	Absent	39 (78%)	4(8%)		
Peritonitis	Present	12 (24%)	5 (10%)	5.08	0.024
	Absent	31(62%)	2 (4%)		
Intra-operative hypotension	Yes	4 (8%)	4 (8%)	10.25	0.001
	No	39 (78%)	3 (6%)		
Post-operative complication	Yes	9 (18%)	6 (12%)	12.03	0.001
	No	34(78%)	1 (2%)		
	Emergency	30(60%)	7(14%)	Likelihood ratio	0.032
	Elective	13(26%)	0		

P value < 0.05

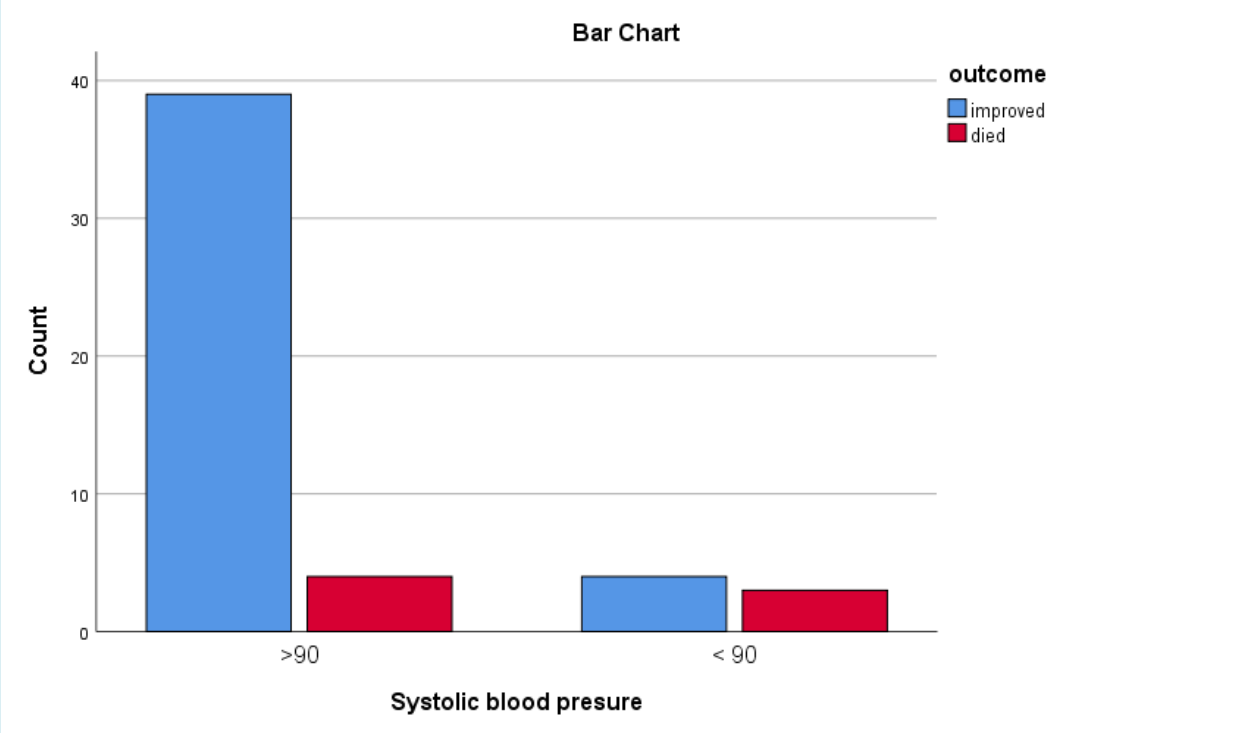


Fig.6 SBP vs Outcome

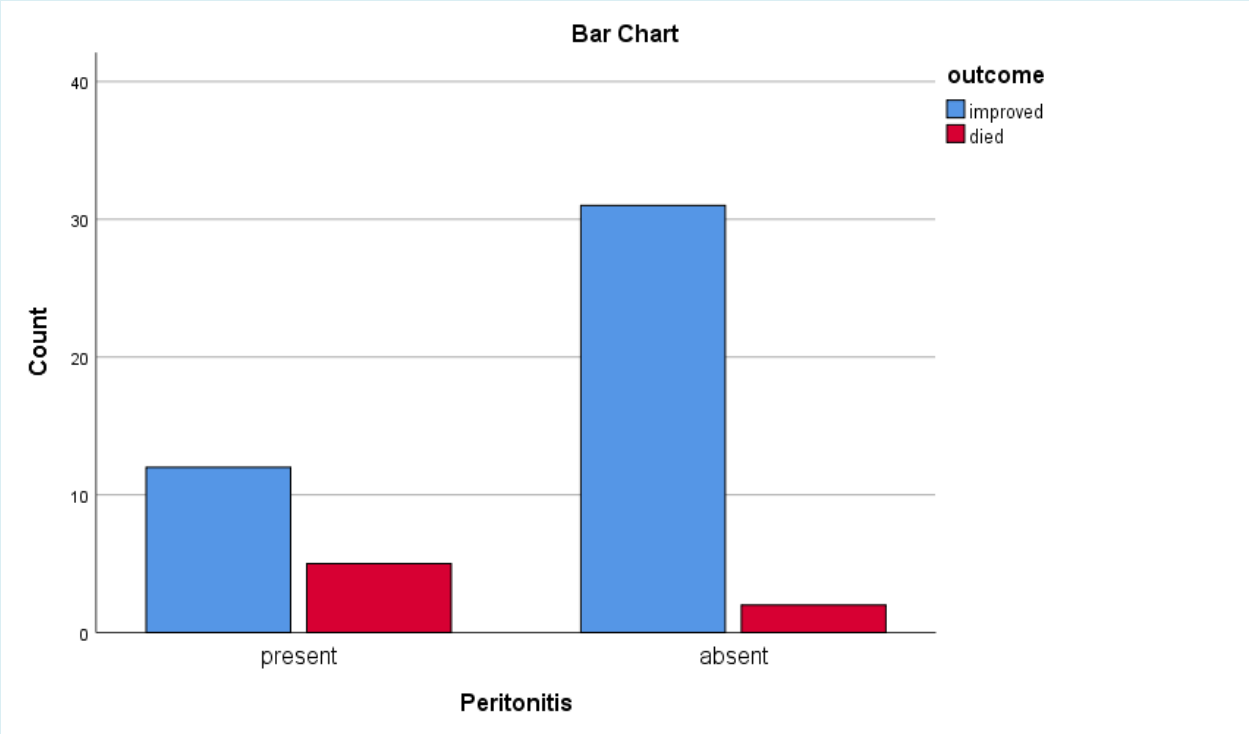


Fig.7: peritonitis vs outcome

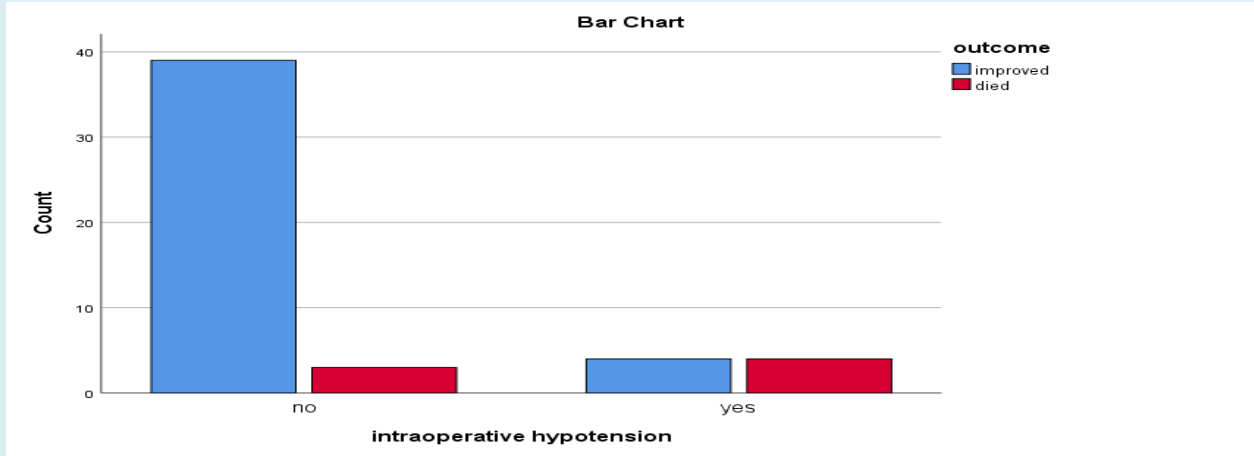


Fig.8: intra-operative hypotension vs outcome

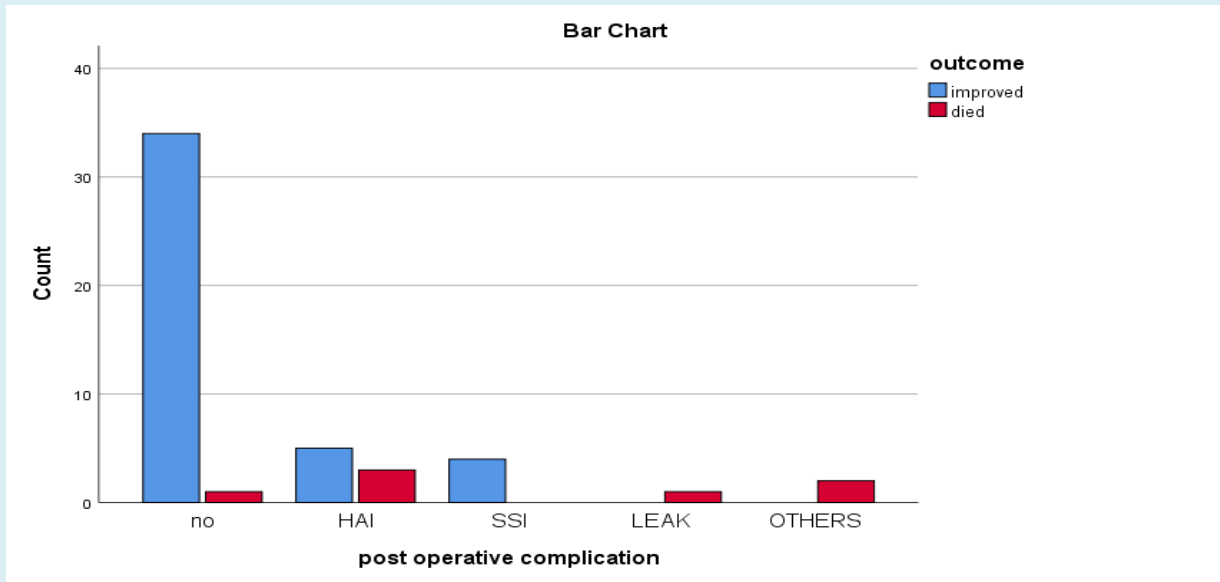


Fig.9. post-operative complication vs outcome

5.2 Discussion

The main objective of this study is to identify common etiology and treatment outcome of adult patient with the diagnosis of large bowel obstruction at Jimma university medical center. In this study a total of 50 patients with diagnosis of LBO managed surgically within six months study period are involved. Mean age at diagnosis was 46.76 years (standard deviation (SD) \pm 15.06) years. two peaks of age have been identified with first peaks being between 36-45 years (34%) the second peak is above 56 years (32%). The overall gender incidence was in favor of male, which is consistent with other reports done in Nigeria and Eastern India, which ascribed to the higher prevalence sigmoid volvulus and large bowel malignancy in males (36, 39). Worldwide, large bowel obstruction causes significant admission and affects the lives of million individuals, with considerable healthcare cost and burden (38)

The most common causes of large bowel obstruction vary widely with geographic region, socioeconomic status and patient's age group. In this study the commonest causes of large bowel obstruction colonic volvulus (50%), colorectal tumor (26%), which is correspond with the leading causes of obstruction reported in North Central Nigeria and Omdurman Hospital in Sudan (41, 42). However, this differs from studies performed in western countries like USA where the colorectal tumor is the most common cause of LBO (4,6). This is because one of the extrinsic risk factor for colorectal cancer is consumption of western diet, commonly used in industrialized nation. While in developing country most of the time they consume high fiber diet, which increase the stool bulk, dilute toxins and reduce the colonic transit time and thus the exposure time to fecal carcinogens. (35, 38, 39, 40)

This study found that the presence of shock and peritonitis, intra-operative hypotension and gangrenous bowel was significantly associated with adverse outcome (death) which was similar with other studies done in Ethiopia ,Nigeria and Barcelona Spain(2, 6 and 7). The presence of post-operative complications are also significantly affects the management outcome, which was similar with study done in Nigeria and eastern India (7, 36, and 41).

However, the presence of comorbid medical illness and duration of presenting illness, which appears significantly, associated with in hospital mortality in the other study (36, 42) it did not appears associated with mortality in this study.

Emergency operative intervention associated with significant post-operative morbidity similar to other study. In this study, all patients were ultimately managed surgically and different procedures was used with the commonest one was resection & primary anastomosis (elective) and Hartmann's procedure resection & stoma (emergency), which is similar with studies done in Ethiopia Sudan and Nigeria (7, 41, and 42). Other procedures include; derotation laparotomy & hemicolectomy. The choice between different types of procedures is depend on the cause of obstruction, presence of peritonitis at presentation, presence of shock and intra operative finding.

A high morbidity accompanying large bowel obstruction is demonstrated by complications rate of 30% from this study. Hospital acquired infection (HAI) the leading post-operative complication (16%) followed by SSI (8%) were the most common in our patients but others have equally reported systemic and local complication as common post-operative complications. In this study, seven patients are died with a mortality rate of 14%. In other reports, mortality rate varies between 1.5% and 14%. (39,40) .Outcome of obstructions of the bowel may also vary depending on underlying etiological factors, presence of comorbidities, advancement of age or the timing of institution of treatment in other study though it has weak association in our case which is probably explained by small sample size. Identifying the prognostic indicators of survival in the patients is important in guiding future therapeutic decisions and maximizing favorable outcomes. In this study, mortality statistically correlate with the presence of shock, presence peritonitis, bowel condition intraoperatively and presence of post-operative complication

5.3 Conclusion and Recommendations

Majority of large bowel obstructions in Ethiopian and Africa including our case caused by volvulus; however, neoplasms have replaced volvulus as the leading cause of large bowel obstruction in some geographic regions. Most commonly affected age groups between 35-45 years followed by age after 56 years. Most patients present 72 hours later the onset of symptoms. Laparotomy was means of LBO management, while primary resection and anastomosis was the most common intra-operative procedure followed by resection & stoma and Hartmann's procedure. The most commonly encountered postoperative complications were hospital acquired infection, surgical site infection. Prognosis with adverse outcome is associated with the presence

of shock or intra-operative hypotension, bowel condition intraoperatively and presence of post-operative complication.

Our findings suggest that health professionals in the hospital and district should increase public awareness on LBO by providing appropriate health information about the risk factor and symptom of large bowel obstruction so that patient should visit health facility as early as possible. In this study 8 out of 22 patients (36%) with sigmoid volvulus they report at least one previous episodes attack which is quite significant therefore responsible physician should able to convince patient for elective surgery during index admission. Majority of patients with sigmoid volvulus without peritonitis can effectively managed by rectal tube deflation, which avoids emergency operation and morbidity and mortality associated with it. Physicians should diagnose the cause of large bowel obstruction early and appropriate interventions should be taken on time before the intestine develops gangrene. For a patient in shock at presentation and has medical comorbidity, these should be corrected timely. We recommended strict implementation of surgical site infection (SSI) prevention methods, since SSI is common causes of post-op morbidity. Further prolonged research using prospective study design to overcome the limitations this study (small sample size) is our recommendation.

5.4 Limitations

Although data in this study primary and complete which is the major advantages study design ,due to small sample size (limited study period) some of factors found to affect outcome in others larger study were found less associated in this study. Therefore to dig out these and additional factors associated with large bowel obstruction outcome I recommends longer prospective design to have enough sample size which represent population at large.

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ANNEXE

QUESTIONNAIRE

Assessments of etiology and treatment outcome of large bowel obstruction among adult patients visiting JUMC from July 1, 2021 to December 30, 2021, at JUMC Jimma zone, Oromia region, Ethiopia.

PART 1 SOCIODEMOGRAPHIC AND PATIENT CHARACTERISTICS

Patient identification

Date of interview_____

phone number_____

Card number_____

Socio demographic data

Age _____

Sex a Male b Female

Religion

Muslim

Protestant

Orthodox

Other

Address

Jimma zone

Snp

Buno bedelle

other

Ilubabor

Occupation

student

Government employee

Farmer

private employee

Merchant

any other please specify_____

Educational level

No formal education

Can read and write

Elementary (1-8)

High school (9-12)

Above high school

Marital status

Single

Divorced

Married

Widowed

PART 2 CLINICAL PRESENTATIONS

History

Duration of presenting illness(specify with hours)_____

Symptoms at presentation (please tic box if any of the following symptom present)

Abdominal pain

Yes

Diarrhea

No

Yes

Vomiting

No

Yes

Abdominal distension

No

Yes

Constipation

No

Yes

Previous abdominal surgery

No

Yes

Obstipation

No

Yes

Bleeding per rectum

No

Yes

No

	Yes
Weight loss	No
Yes	If yes for 11 then how much
No	1 episodes
	>1 episodes

Previous similar episodes

Physical examination

Vital sign SBP

>90mmHg

90mmHg

Peritonitis present	Abdominal mass
---------------------	----------------

Yes	Yes
-----	-----

No	No
----	----

Pertinent PR finding	Blood
----------------------	-------

Mass	None
------	------

Investigations

Laboratory

CBC = WBC _____ HCT _____

RFT= Creatinine _____ BUN _____

Serum electrolyte =Na+ _____ K+ _____ Cl- _____

Imaging with finding

plain abdominal x-ray _____

abdominal U/S _____

abdominal CT _____

Colonoscopy finding _____

Biopsy _____

Diagnosis

Preoperative final diagnosis _____

Additional diagnosis (comorbidity)

DM

Cardiac pt

HTN

RVI

Asthma

Modes of admissions 1) elective 2) emergency

PART 3 MANAGEMENT AND OUTCOME

Patient preparation

Number of isotonic crystalloid given _____

Response BP _____ PR _____ Urine output _____

Preoperative antibiotic 1) yes 2) No,

if yes specify type of antibiotic _____

What is an indication for antibiotic 1) Prophylactic 2) Therapeutic

Non operative management tried 1) yes 2) no

If yes what was done,(please mark the type of intervention)

NGT & bowel rest

Rectal tube deflation

Other mention _____

Is non operative management successful? 1) Yes 2) No

If yes for above question what was their subsequent operative intervention?

If the patient is operated

For emergency case time interval between arrival & operation in hours _____

For elective patient is Preoperative bowel preparation performed 1) Yes 2) No

Intra operative findings

Hernia 1) Viable 2) strangulated

Sigmoid volvulus 1) viable 2) gangrenous

Cecal volvulus 1) viable 2) gangrenous

Adhesions and Bands

Ileosigmoid knotting 1) viable 2) gangrenous

Intussusceptions 1) viable 2) gangrenous

Colorectal mass

Site_____

Type

benign

malignant

Others_____

Procedure done

Derotation laparotomy

Resection specify region & extent of resection

Anastomosis specify type

Stoma specify type _____

Adhesion lysis & Band release

Manual reduction

Others (specify)_____

Intra operative hypotension episodes 1) Yes 2) No

If yes does vasopressor started 1) Yes 2) No

Intra operative diagnosis _____

Post OP Clinical Course

Any Post op complication 1. Yes 2. No

If yes for above question what type is it

HAI

MI

Superficial SSI

RF

Complete wound dehiscence

Anastomotic leaks

Other specify _____

Outcome of the patient

Improved and discharged

Died If died probable cause of death

Due to sepsis from the index diagnosis

Due to complications

Due to comorbidities

Unknown

If any other please specify _____

Length of hospital stays in days _____

Consent Form

This study is conducted by Dr **Mohammed Hassen** final year general surgery resident on adult patients with diagnosis of large bowel obstruction who visited JUMC. The study is aimed to describe sociodemographic characteristics of LBO, to assess common etiology of LBO and to evaluate treatment outcome of large bowel obstruction among adult patients visiting JUMC. Information that you will give us is quite useful to achieve the objective of the study. We would like to assure you that your name or picture of you will not be mentioned and the information that you give us will be kept confidential and only used for research purposes & so no fear for social stigma. Though the direct benefit you may get from this study is limited, participating in this study doesn't have any harm to you. We hope that the results of this study will be an important adjunct to identify areas of development to enhance effective health care, policy formulation and implementation which intern enhance treatment and outcome of patients with large bowel obstruction. It may also serve as a baseline data for other study of similar kind. You have a full right to refuse to take part or to interrupt the interview at any time.

I _____ confirm that I have been fully informed the purpose of the study & decided to participate. Signature _____

Name of Data Collector _____ .Signature _____

Date: _____

Contact Person: **Dr.Mohammed H. Tel: +251911330919**

Any remark _____

Guyyaa _____

Hiika walii galtee qorannoo kana keessatti hirmaachuuf guutamu.

Qorannoon kun kan geggeessamuu Giddugala fayyaa jimmaa yuunivarsiitiitti, muummaa wal'aansa baqaqsanii yaaluutti barataa ispeeshalayizeeshinii wal'aansa dhibee baqaqsanii yaaluu kan ta'e Dok.Mahammad Hassan

Qorannoon kun waa'ee dhibee mar'uumaan furdaa duchuu, mallattoolee dhukkubichaa, rakkoolee kanaaf nama saaxilani fi firii wal'aansa dhibee kanaa fi wantoota firii wal'aansa kanaa jijjiiran addaabasuu ta'a.

Infoormeshinin nuuf kennitan qorannoo kana galmaan gahuuf haalaan nugargaara.Qorannoo kana keessatti maqaa fii fakkiwan eenyumma keessan ibsan tokkoyyuu hinfayadamnu Ichittin dhukkuba keessanii qaama biraatiif dabarsamee hin kennamuu

Qorannoon kun isinif fayidaan inni kallattiin qabu murasa hata'uu malee qamolee mootummaa poolisii faayyaa baasaniifi namoota gara fulduratti mataduree kana irratti qorannoo dabalata gagessaniif akka bu'uuratti tajajila akkasumas, namoota gara fuula duraatti rakkoon akkasii isan mudatuuf faayidaa guddaa qaba

Anis_____ barbaachisummaan qorannoo kanaa erga sirriitti natti himamee fi hubadheen booda, qooda akka fudhachuu danda'u fedhii kootiin walii galuu kiyyaa mallattoo kiyyaan arman gaditti nimirkanessa

Hubbannoo: qorannoo kana yoo isiif hin mijanne ykn yoon fedhii dhabdan, haalduree tokko malee addaan kutuuf mirga keessan. Kunis wallaansa isiif kennamurratti dhiibbaa tokkoolee hin uumu.

Mallattoo qooda fudhataa_____

Maqaa dataa sasabduu_____Mallattoo_____

Qorataa:Dr Mahammad Hassan Lakk.bilbilaa +2510911330919

Yaada dabalata_____

የመጠይቅ ዉል ስምምነት

ይህ ጥናት የሚከናወን በጅም ዩኒቨርስቲ ህክምና ማዕከል በቀይ ህክምና ክፍ የመጨረሻ አመት የቀይ ህክምና ተማሪ **በዶ/ር፡መሀመድ ሀሰን** ነው። የጥናቱ ትኩረት የትልቁ አንጀት የመዘጋት መንስዔ ፣ ተጋላጭነትን የሚጨምሩ ነገሮችን መለየት፣ ለበሽታው የሚደረግ የቀይ ህክምና አይነት ዕና ውጤት እና በህክምናው ውጤት ላይ አሉታዊ ተፅዕኖ የሚያሳድሩትን ነገሮችን መለየት ይሆናል። ለዚህም የሚሰጡን መረጃ ለጥናቱ እጅጉን አስፈላጊ ነው። የማገኘው መረጃ ለጥናቱ ብቻ እና ብቻ የምጠቀም ሲሆን ይም የእርሶን ማንነትን በማይገልፅ መልኩ እንደሆነ እና የእርሶን የህክምና ሚስጥር ለሌላ ወገን አሳልፌ እንደማልሰጥ መግለፅ እወዳለው። የጥናቱ ውጤት ምንም እንኳን ለእርሶ የተለየ በቀጥታ ጥቅም ባይኖረውም ለጤና ፖሊሲ አውጪ አካል እንደ ግብአት ያገለግላል ፣ ወደፊት በተመሳሳይ ርዕስ ተጨማሪ ጥናት ለሚያረጉ ሰዎች ዕንደ መነሻ ሊያገለግል ይችላል ። በተጨማሪም ወደፊት በተመሳሳይ በሽታ ለሚመጡ ታካሚዎችን ለማከም ጉሊህ አስተዋፆ ይኖረዋል።

በማንኛውም ሰአት በጥናቱ ላለመሳተፍ ከወሰኑ ያለምንም ቅድመሁኔ ለማቋረጥ ባለሙሉ መብት ነው። ይህም በሚደረግሎት ህክምና ላይ ምንም አይነት አሉታዊ ተፅዕኖ እንደማያደርስ ላረጋግጥሎት እወዳለው።

እኔ _____ በተደረገልኝ ገለፃ መሰረት ተስማሚኛ በጥናቱ ለመሳተፍ ፍቃደኛ መሆኔን በፈርማዬ አረጋግጣለው።

የታካሚው ፊርማ _____

የዳታ ሰብሳቢው ስም _____ ፊርማ _____

የጥናቱ ባለቤት ስም **ዶር መሀመድ ሀሰን** የስልክ ቁጥር **+2510911330919**