



Prevalence and Management Outcomes Of Intestinal Obstruction among Surgically Treated Acute Abdomen Patients at Saint Paul's Hospital Millennium Medical College, Addis Ababa Ethiopia

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ABSTRACT

Background: Intestinal obstruction is the most common surgical emergency worldwide and the cause of intestinal obstruction is either mechanical or non mechanical. Its incidence varies from country to country as well as from area to area within a country. In Africa, acute intestinal obstruction accounts for a great proportion of morbidity and mortality. Ethiopia is one of countries where intestinal obstruction is a major cause of morbidity and mortality.

Depending on the findings intestinal obstruction managed conservatively or surgically even if several factors contribute to poor management outcome, like age of the patients, duration of illness, extent of bowel involved, and initial management and length of hospital stay.

Objective:-The objective of this study is to assess prevalence and management outcomes of intestinal obstruction among surgically treated acute abdomen patients at Saint Paul hospital millennium medical college, Addis Ababa, Ethiopia.

Method:- A two year hospital facility based cross-sectional document review study was done from September 1/2016 to August 30, 2017 at SPHMMC.

Secondary data collected by trained data collectors (Intern physicians, Nurses and HIMS trained person) from operation book, ICU and surgical ward registrations book, Anesthesia book and patient's charts.

Socio-demographic characteristics, preoperative diagnosis, duration of symptoms, operative findings, procedure done, length of hospital stay and outcome of management was collected. Coded data entered into SPSS Version 21. Data was explored to see any missing values and outlier's. Then data analysis was performed using SPSS 21 software.

Descriptive statistics was used to describe socio-demographic variables and binary logistic regression analysis was applied to explore the association between management outcome of surgically treated intestinal obstruction and independent variables.

Results: There were a total of 506 surgically treated cases of acute abdomen within the study period, among them 186 cases were surgically treated intestinal obstructions. The prevalence of

intestinal obstruction among surgically treated acute abdomen cases was 36.7%. The male to female ratio of intestinal obstruction cases was 2.6:1.

Among intestinal obstruction cases small bowel obstruction accounted for about 113 cases[60.7%] and large bowel obstructions 73 cases[39.3%]. The ages ranged from 16 year to 85 years with a mean and standard deviation of 42.9 and 18.5% respectively. The leading cause of small bowel obstruction was adhesion band in 31(16.7%) patients followed by small bowel volvulus 28(15.05%) and hernia 27(14.5%) respectively.

The commonest cause of large bowel obstruction was sigmoid volvulus 44[23.6%] followed by colorectal malignancy 33[17.7%]. Bowel resection rate was at 67(36.0%).The commonest complications were surgical site infection 25(13.4%) followed by anastomotic leak 10(5.4%) and Mortality rates was 15[8.06%].

Length of hospital stay and initial management were found to be significantly associated with management outcome of patients with intestinal obstruction.

Conclusions: the prevalence of intestinal obstruction is high [36.7%] among surgically treated acute abdomen cases. The study showed 130(69.9%) had good management outcome and length of hospital stay and initial management were found to be significantly associated with management outcome of patients with intestinal obstruction.

Recommendations

Early diagnosis, adequate preoperative resuscitation and proper post operative care would help to reduce further observed mortality. This could be achieved by increasing public awareness on clinical features of intestinal obstruction adequate pre-operative resuscitation and initiate of antibiotic for those who develop gangrenous at preoperatively and importance of early referral to higher center. Moreover, health facilities capable of handling patients with intestinal obstruction should be available within the reach of the community.

Further research using prospective study design is warranted as a way to overcome the limitations of secondary data in the current retrospective research that preclude generalization to the whole population.

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ACRONYMS AND ABBREVIATIONS

BLH: Black lion Hospital

CBC: Complete Blood Count

GUH: Gondar University Hospital

IO: Intestinal Obstruction

LAP: Lymphadenopathy

LBO: Large Bowel Obstruction

NGT: Naso gastric tube

PUD: Peptic ulcer disease

R&A: Resection and anastomosis

SBO: Small bowel obstruction

SBV: Small Bowel Volvulus

SPHMMC: Saint paul's hospital millennium medical college.

IRB... Institutional review board

SSI.....surgical site infection

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CHAPTER ONE:-INTRODUCTION

1.1 BACKGROUND

Intestinal obstruction (IO) is defined as partial or complete blockage of the bowel that results in the failure of intestinal contents to pass through it. It is a common cause of emergency surgical problem. The incidence of IO varies in different countries. It is rare in USA and Western Europe but it is more common, India, Iran and Afghanistan [1] .

The leading cause of intestinal obstruction in developed world mostly been adhesion and in Africa hernia and volvulus are most frequent. There are, however, some African studies which are pointing to change these establish patterns [2, 3]. Intestinal obstruction has been the leading cause of acute abdomen in several African countries and IO secondary to adhesion is the most frequently seen in developed world. The cause of intestinal obstruction are several and their relative incidence varies in different population, between countries and has also changed over the decades(8,9).

Ethiopia, little is known about the ground the general patterns and relative incidence of IO. According to the few reports available in Northern and central Ethiopia, sigmoid volvulus was the leading cause of IO. Two reports from yirgalem and Hosanna, southern Ethiopia, showed that small intestinal volvulus(SIV) as the most frequent cause of IO. Several factors are described to be responsible for intestinal obstruction. Socioeconomic factors and diet have mostly been incriminated to be responsible [12,13,14,19].

1.2 Statement of the problem

Intestinal obstruction is one of the commonest abdominal surgical emergencies, when it is not relieved in time, the patient may die .Early diagnosis and prompt management is mandatory. Intestinal obstruction is global problem consuming much in terms of surgical services. It is also leading cause of acute abdomen in several African countries including Ethiopia [4, 8]

A better understanding of the patho physiology of bowel obstruction and the use of isotonic fluid resuscitation ,intestine tube decompression and antibiotics have greatly reduced the mortality rate of patients with mechanical bowel obstruction. The metabolic effects of fluid loss depend on the site and duration of the obstruction .With a proximal obstruction ,dehydration may be accompanied by hypochloremia, hypokalemia ,and metabolic alkalosis associated with increased vomiting .Distal obstruction of small bowel may result in large quantities of intestinal fluid into the bowel ;however abnormalities in serum electrolytes are usually less dramatic [9,10].

Ultimate clinical decisions regarding the management of these patients dictate a thorough history and workup and heightened awareness of potential complications .Early in the course of an obstruction intestinal motility and contractile activity increase in effort to propel luminal contents past the obstruct point. The increase peristalsis that occurs early in the course of bowel obstruction present above the point of obstruction , later in the course of obstruction ,the intestinal becomes fatigued and dilates ,with contractions becoming less frequent and intense . As the bowel dilates, water and electrolytes accumulate both intraluminally and in the bowel wall itself. This massive third-space fluid loss accounts for the dehydration and hypovolemic.

Oliguria, azotemia, and hemoconcentration can accompany the dehydration .Hypotension, increase intra-abdominal pressure, decrease venous return, and elevation of diaphragm, compromising ventilation which can serve to further potentiate the effect of hypovolemic [19].

1.3 Significance of the Study

This study would help to detect the prevalence and management outcome of IO in Saint paul hospital millennium medical college. This will have further advantage to describe morbidities and mortality of patients caused by IO. It will also have significant advantage for health professionals in that it will add useful information regarding prevalence of IO and management outcome like the importance of early prediction and detection of IO, initiation of resuscitation and early decision whether patient need conservative or definitive management .

The outcome of this study will also add epidemiological and clinical information that will serve as essential input for policy makers to design proper strategies and serve as baseline information for other studies.

CHAPTER TWO:- LITERATURE REVIEW

Research done in Eastern India, 367 patients (9.87%) was diagnose intestinal obstruction in which affect mostly males (75.2%) than females (24.8%).The most common occurrence was in the age group 20-60 years (64.03%), followed by the group >60years (26.7%), while the least common occurrence was in age group <20years (9.26%).Mean age of patients was 41.27 years while the median age was 44 years. The cause of were obstructed/strangulated hernia (36%),malignancy(17%),adhesion(16%),intestinal TB(14%),volvulus(6%) and intussusceptions(2%).Complication in the postoperative period occurred in 26%of patients Of these ,10% had a single complication while the remaining 16% encountered more than one complication .Wound infection was the most common complication , occurring in 12% of patients and of these 6% of patients required application of secondary sutures .Burst abdomen requiring emergency closure of abdomen occurred in 4.4%.Prolonged ileus (more than 72h) occurred in 9.26%. Basal atelectasis was noted in 8.45% mostly of the elderly age group. Sepsis developed in 13.5% of patients with intestinal tuberculosis .Small bowel fistula developed in 2% of patients and of them 1.09%required operative intervention in the long run [1].

A five years retrospective study in Ruanda shows that one hundred and five patients aged between 1 month and 80 years (mean age 31.8years) were operated on for intestinal obstruction during the study period. There were 76 males (72.4%) and 29 females (27.6%) and the female ratio was 2.6:1.Eghty-two patients (78.1%) presented more than 24 hours after the onset of the the symptoms. The average duration of symptoms was 3.5 days .Inguinal hernias were the leading cause of intestinal obstruction followed by intussusceptions. Adhesion occupied the third position .thirty eight patients had intestinal resection followed by intestinal anastomosis. The rate of intestinal resection was 36.2% .The highest rate (more than 80%) of resection were observed in sigmoid volvulus, internal hernias , cecal volvulus and ileo-sigmoid knotting[2] .

The result of a one year retrospective review on acute bowel obstruction again in northern Ruanda shows a male to female ratio of 2.2:1. The age of the patients ranged from one week to 80 years with a mean of 31.5years.

The duration of symptoms ranged from 1 to 14 days with a mean of 4 days. The commonest cause of obstruction were hernia ,adhesion , volvulus and intussusceptions .Of the 23 patients

with volvulus ,17 involved sigmoid colon ,but other presentations of volvulus were also seen ; ileo sigmoid knotting ,cecal volvulus ,volvulus neonatorum ,and small bowel volvulus .There were two anastomotic leaks and three deaths of following operative treatment of all causes of volvulus. Ileocolic intussusceptions was the commonest presentation of intussusceptions of accounting for 12 to 15 case.

There were two cases of ileoileal intussusceptions and one case of colocolic. Of the 53 patients with hernia ,32 were inguinal ,14 umbilical .There was one internal hernia ,three femoral and three epigastric hernia,10 of 53 hernias were strangulated required bowel resection .Forty eight percent of patients had bowel resection and this was most frequent amongst those presenting with volvulus, intussusceptions and adhesions. The resection rate was higher in patients who stayed longer at home and presented with duration of symptoms of more than one day. Length of hospital stay ranged from 1-39 days with a mean of 8 days and a mode of 2 days.

The median length of hospital stay was six days. Bowel resection was associated with a longer hospital stay, with 73% of 59 patients who stayed for seven or more days being those who had bowel resected .The commonest complications were wound sepsis and /or dehiscence, septicemia and organ dysfunction/failure and Anastigmatic leak. Others included deep venous thrombosis, bronchopneumonia and cardiac arrest. The mortality rate was 12.9% [3, 4, 5].

Similar study in Nigeria on seventy six cases of IO shows that male to female ratio of 2:1 and major complaints were abdominal pain (90%), distention (85%), vomiting (71.2%) and constipation (65%). The commonest causes of obstruction in adult patients were strangulated hernia and adhesive bands while in pediatric age group it was intussusceptions. Other study on spectrum of cause of IO Nigerian adult put fibrous adhesion as the commonest cause of obstruction followed by volvulus and hernia.

Initial management of all patients included intravenous fluid and electrolyte correction and resuscitation. Only 16% of patients in adhesive obstructive group responded to conservative treatment;84% required surgery .Of ,32% had bowel resection and anastomosis for strangulation .There were 3 death in adhesive obstruction group ;2 preoperatively from late presentation complicated by acute renal failure and septic shock ,while the third death resulted from postoperative septic shock . All patients with sigmoid volvulus were operated on .Of 5

patients who had resection and primary Anastomotic, leak the only morbidity was case of minor wound infection. One of the 2 patients treated with resection and colostomy developed a pelvic abscess. One patient died from Anastomotic leak after surgery for compound strangulated volvulus. Of eleven patients with obstructed hernia ,7 required emergency operations while 3 others were electively repaired following spontaneous reduction .The remaining patient died before surgery from acute renal failure .The overall mortality rate was 14%.The operative mortality of 11% include 7 cases of strangulating obstruction ,3 of advanced colorectal carcinomas and 1 of simple obstruction . The remaining deaths occurred before surgery from complication in patients presenting late with neglected obstruction [6, 7] .

In Ethiopia, research on Acute abdomen in TAH 2000 by Berhanu Kotiso , Shows Intestinal obstruction (26%) out of which Small bowel is 52.3 % and Large bowel is 46.7 %.[8]

Four year retrospective study at Gondar University Hospital shows that emergency

Laparotomies for non-traumatic acute abdomen were 43.3% of all laparotomies. The leading operative diagnoses were SBO (43.4%) and LBO (11.5%). Majority of surgically treated bowel obstruction patients were from rural areas (58.2%) Abdominal pain (100%), Vomiting (90.3%), abdominal distension (58.3%) and constipation (55.3%) were the commonest symptoms in patients with bowel obstruction [9, 10, 11, 12, 13, 14].

. Pattern of acute abdomen in Yirgalem Hospital, southern Ethiopia by Asefa Z shows that out of 229 cases of acute surgical abdomen (From Jan. to Dec. 1997) SBO ranked the 1st (mainly Small intestine Volvulus) and LBO - 3rd (mainly sigmoid volvulus)[15] .

The knowledge of patterns of obstruction in country as well as in different parts of the country has significant value in fast diagnosis and on time surgical intervention which result in good outcome of the patient [15, 16,].

Two hundred and thirty five were operated for IO during the four year retrospective study period in Hosanna hospital ,southern Ethiopia , of whom 41.7% case had small intestinal volvulus followed by sigmoid volvulus (13.6%),postoperative adhesion (11.5%) and intussusceptions (8.5%).The male to female ratio was 8.8:1.The age ranged from 16 to 65 years

with a mean of 34.1. The peak of occurrence was between 20 and 40 years which constituted 63% of the patients.

Similarly, a study done in Black lion hospital (BLH) shows that the mortality of 35.2% and 21.2% for sigmoid volvulus and small bowel obstruction respectively. In those studies duration of illness was found to be strongly associated with mortality rate. Patients who presented within two days of their illness had mortality rate of 7.6% whereas those presented later than two days had mortality rate of 25%[15,16,17,18]. The commonest symptoms of IO and outcome of emergency laparotomy may be affected by different factors. Some of these factors include the cause of obstruction, duration of illness, age, presence of peritonitis, hematocrit level and complication detection [18, 19, 20, 23, 24].

A three years retrospective study done at Adama hospital revealed that prevalence of surgically treated intestinal obstruction was 21.8%. Small bowel obstruction is more common than large bowel.

Length of hospital stay and duration of illness were found to be independent predictors of management outcomes[25].

CHAPTER THREE: OBJECTIVES

3.1 General objective

The objective of this study is to assess the prevalence and management outcomes of intestinal obstruction among surgically treated acute abdomen patients at SPHMMC from september1, 2016 to august 30, 2017 GC.

3.2 Specific objectives

1. To assess prevalence of intestinal obstruction among surgically treated acute abdomen patients at SPHMMC.
2. To assess management outcomes of intestinal obstruction among surgically treated patients at SPHMMC.
3. Factors affecting management outcomes of intestinal obstruction

CHAPTER FOUR: METHODOLOGY

4.1 STUDY AREA

The study will be conducted in St Paul's hospital (SPHMMC) which is located in Addis Ababa, Ethiopia. St. Paul's hospital is the second biggest hospital in AA which serves as a referral center for patients from Addis Ababa and all over the country.

SPHMMC is located in the northern part of Addis Ababa. The hospital has a total of 1200 professionals and supporting staffs and 450 beds. On average it provides health service for 16000 inpatients and 200,000 outpatients and 5000 surgeries annually.

It is also a teaching hospital for SPHMMC & AAU for both under graduate and post graduate students. The hospital has Surgery, Gynecology/obstetrics, and Internal medicine, Pediatrics, Radiology, Ophthalmology, Psychiatry, Pathology, Dermatovenereology, ENT and Dentistry. The study will be conducted from sep 1,2016 to august 30,2017 G.C,

The Hospital has been giving surgical care since the beginning of its establishment. The treatment providers include more than 20 general surgeons,6 urologists, one pediatric surgeon, and surgical residents. The hospital has shortage of trained manpower in pediatrics surgical nursing, anesthesiologist and intensivists. The general surgical ward has a total of 74 beds, 12 pediatric surgical beds,18 urologic beds and there is no surgical ICU. The department provides surgical care for more than 5000 adult patients annually.

4.2 study design

A facility based cross sectional study was conducted from September 1 ,2016 to august 30,2017/ G.C. by using document review.

4.3 population

4.3.1 Source populations:

The source populations were all patients getting operative management for acute abdomen with in the study period..

4.3.2 Study population

Patients getting operative management for intestinal obstruction among surgically treated acute abdomen at SPHMMC from September 1,2016 to august 30,2017 G.C were the study populations.

4.3.3 Inclusion and Exclusion

Inclusion criteria: - All adult patients, who are operatively management for intestinal obstruction at SPHMMC from September 1,2016 to august 30,2017 will be included in the study.

Exclusion criteria: - Patients with sub acute obstruction, those with intestinal obstruction who were managed conservatively, those patients had incomplete data records and those patients below the age of 15.

4.4 Sample size:

All patients operated for intestinal obstruction among surgically treated acute abdomen during the study period were included.

4.5 Data collection method

Data were collected from patient records, registration books,morning report books ,major OR registration logbook and anesthesia charts available in the hospital by check list questionnaires using trained data collectors.

First card number of patients in the study period was identified from registration books (logbooks), and then their charts had been retrieved from card office .Finally documents from

patient cards were entered in to structured format by two interns, pre trained BSC Nurses and ME.

4.6 Study variables

Independent variables

Socio-demographic variables (Age, Sex, Residence)

Clinical symptom

Duration symptom

Investigation

Preoperative diagnosis

Initial management

Preoperative antibiotic

Operative finding

Procedure done

Length of hospital stay

Post operative complication

Time of complication

Condition during discharge

Duration of postoperative antibiotic

Dependent variables

Management outcome of surgically treated intestinal obstruction.

4.7 Data analysis

The collected data were checked for its completeness, any error and missing value identified and corrected. Data analysis was performed using SPSS 21 version software. Descriptive statistics was used to explore categorical variables and binary logistic regression analysis was applied to explore the association between dependant and independent variables. Variables who had statistically significant Association with management outcome of surgically treated intestinal obstruction was identified by calculating crude odds ratio (COR) and adjusted odds ratio (AOR) together with 95% confidence intervals. All the tests were considered significant at $P < 0.05$.

4.8 Ethical consideration:

Ethical clearance was obtained from Ethical committee of SPHMMC , post graduate research program and letter of cooperation was obtained from SPHMMC administration office .All information obtained from patients' card was kept confidential.

4.9 Data quality management

Regular daily supervision was done to check, the consistency and completeness of the filled out questionnaires, by the principal investigator. Also, before starting data analysis completeness was checked, to assure the quality of data. Data collectors and supervisors was trained and regular supervision and follow up was made by supervision.

4.10 operational definitions

Initial management: Is initial management of patients with adequate IV access for resuscitation, placement of NGT or initiation of antibiotics.

Operative management: Means surgical exploration of the abdomen which is determined by the nature of obstruction.

Hematoma and seroma: Post operative accumulation of blood and serum in side surgical wounds
surgical site infection (SSI): Infection following surgical incisions and classified as.

1. Superficial incisional SSI: Infection occurs within 30 days and or up to 1 year if prosthetic device is used after operation and infection involves only skin or subcutaneous tissue of the incision.

2. Deep incision SSI: Infection occurs within 30 days and or up to 1 year if prosthetic device is used after the operation and infection

3. Organ /space SSI: Infection or leak within 30 days and or up to 1 year if prosthetic device is used after operation.

Facial dehiscence: Is facial disruption due to abdominal wall tension overcoming tissue or suture strength, or knot security.

Postoperative pneumonia: Suspected in patient clinical findings of infection including fever, cough, or purulent sputum in the postoperative period.

Simple SBO (paralytic ileus): SBO other than incarcerated hernia in which strangulation is not suspected.

Procedure done: The main procedure done after laparotomy to relieve the obstruction .

Length of hospital stay: The duration of time from admission to discharge or death of the patient classified as prolonged it is more 8 days.

Management outcome: The condition of the patient after the procedure that means whether he developed complication or not discharged alive or died in the hospital

Management outcome good:- Those patients who do not develop complication or died after the procedure.

Management outcome not good:- Those patients who died at hospital or develop complication after the procedure.

4.11 Dissemination plan of the study findings

The result of the study will be presented to Department of surgery as part of thesis defense and it will be disseminated to SPHMMC community and health policy makers. Further attempt will be made to publish it on national and scientific journals.

Chapter 5: Results:

5.1 Socio demographic characteristics:

The prevalence of intestinal obstruction is 36.7% among surgically treated acute abdomen during the study period. For those age ranges between 16 year and 85 years (mean=42.9, and SD= 18.5) were included in this study. There were 134(72.04%) males and 52(27.96 %) females respectively and the M: F ratio was 2.6:1. There were 112(60.2%) patients from rural resident and 74(39.8%) patients from urban. The vast majority of patients were from Oromia region 138[74.2%], Addis Ababa 42[22.6%], other region 6[3.2%].

Table1:-Socio-demographic frequency of surgically treated patients for intestinal obstruction at SPHMMC (from Sept1, 2016 up to –august 30, 2017 G.C.), (N=186)

Socio Demographic variables	Category	Frequency	Percent
Age	16-25	47	25.3%
	26-35	30	16.1%
	36-45	31	16.7%
	46-55	28	15.0%
	56-65	23	12.4%
	>65	27	14.5%
	Total	186	100%
Sex	Male	134	72.04%
	Female	52	27.96%
	Total	186	100%
Residency	Rural	112	60.2%
	Urban	74	39.8%
	Total	186	100%
Region	oromiya	138	74.2%
	Addis Ababa	42	22.6%
	others	6	3.2%
	Total	186	100%

5.2 Clinical presentation, preoperative diagnosis and initial management:

The vast majority of patients presented with four cardinal symptoms of abdominal distention , abdominal pain ,vomiting and constipation 159(85.5%) and among them 27(14.5%) and 15 (8.06%) had growing swelling and sepsis in addition to the above symptom respectively and 35(18.8%) presented with abdominal pain ,distention and constipation with no vomiting .

As shown in the table 2, the total number of patients diagnosed clinically as SBO were 113,of which 53 (28.5%) were simple and the rest 60 (32.3%) were suspected gangrenous. On the other hand, 31(16.7%) patients diagnosed as simple LBO and 42(22.6%) were suspected gangrenous. .

Regarding the initial managements done to IO cases, 157(84.4%) treated with IV fluid resuscitation, IV antibiotic (Ceftriaxone and Metronidazole) and NGT insertion and 11(5.9%) were treated with iv fluid resuscitation and iv antibiotic where as 18(9.7%) had no taken a antibiotic before operation. All (100%) patients initiated for IV fluid resuscitation preoperatively.

S.No	Diagnosis	Number	Percentage	Total
1	Simple SBO	53	28.5%	28.5%
2	Gangrenous SBO	60	32.3%	32.3%
3	Simple LBO	31	16.7%	16.7%
4	Gangrenous LBO	42	22.5%	22.5%
Total		186	100%	100%

table 2:- Preoperative diagnosis and percentage for operated patients with IO at SPHMMC (Sep 1,2016 upto august 30,2017 GC), (N=186).

5.3 Causes of Intestinal Obstruction and Types of Procedures done:

In our study, small bowel obstruction was the commonest type of intestinal obstruction accounted for about 113[60.7%] cases followed by large bowel obstruction ,73[39.3%] cases. .the most common cause of small bowel obstruction was adhesion band 31[16.7%], followed by small bowel volvulus 28[15.0%] and hernia 27[14.5%] respectively.

The commonest cause of LBO was sigmoid volvulus 44[23.6%] followed by colorectal malignancy 33[17.7%] .

. As shown in the table 3. For 67(36.0%]) patients had resection and anastomosis done which were observed in the highest rates for SBV , intussusceptions and 7 cases of sigmoid volvulus[primary resection and anastomosis] . Resection and anastomosis done for 5[2.7%] of adhesion obstruction. Other commonly performed procedures included, hartmans colostomy 35(18.8%) Adhesionolysis, 34(18.3%) ,derotation 28[15%],Herniorraph with R andA 20 [10.7%] . others 5 [2.7%] (which includes, ileiosigmoid knotting, obstructed tuour) for which unknotting, resection obstructed tumor and biopsy sent then anastomosis done.

Table 1: Frequencies of Surgical Procedures done after laparatomy to relieve the obstruction of operated patients for IO at SPHMMC, from September 1,2016 –august 30,2017 G.C(N=186)

Variable	Category	Frequency	Percent
Procedure done	R\A	67	36%
	Hartmann's colostomy	35	18.8%
	adhesionlysis	34	18.3%
	Herniorraphy with R\A	20	10.7%
	untwisting	28	15%
	others	5	2.7%
	Total	186	100%

5.4 Duration of illness, complication & mortality for patients operated for IO.

The most common complication is wound infection 25[13.4%], anastomotic leak 10[5.4%], fascial dehiscence 6[3.2%] and others 0.1%

The total patients presented before 24hrs. duration of illness 77(41.4%) among these Only 11(5.9%) develop post operative complication, two died, 8 developed SSSI and 1 developed deep SSSI respectively and later discharged improved.

On other hand, patients who presented greater than 24hrs. duration of illness develop more complication. Among 109(58.6%) patients who presented after 24hrs, 35(18.8%) develop post operative complication and 13(6.9%) died at hospital.

All patients who have developed post operative complication were discharged improved. Total mortality rate among the patients was 15(8.06%). Total of 130(69.9%) of patients had good management outcome based on operational definition of our study.

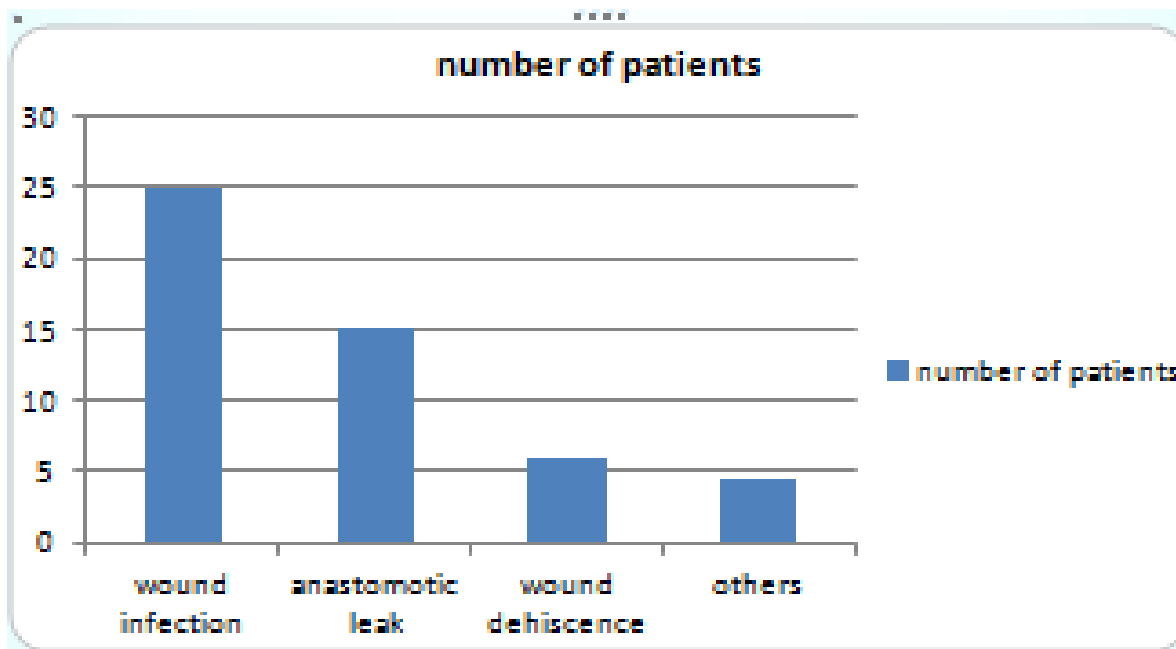


figure 1; prevalence of post op complications among intestinal obstruction

5.5 Factors affecting management outcome of surgically treated patients in intestinal obstruction

The outcome of the final multivariable logistic regression model indicated that duration of postoperative iv antibiotic and duration of symptom ,were dropped from the final model.

Initial management and Length of hospital stay had statistically significant association with management outcome surgically treated IO , with Adjusted odd ratio 0.5(0.3- 0.8), p=0.012 and 2.5 (1.2- 3.6),p=0.04 respectively.

As indicated in table 4, 43(23.2%) management outcome not good for those patients who stay >7days at hospital compared to 9(4.8%) who stay ≤7days . The difference was statistically significant (AOR =2.5, 95%CI: 1.2 – 3.6). **The odds of having bad outcome is 2.5 times higher among patients who stayed more than 7 days than their counterparts.**

Similarly for Those who were managed well initially (those who took all the three resuscitation,IV antibiotics,NGT) **is 50% less likely to have poor management outcome compared to for those not managed well.**

Table 4:- Association of independent variables with management outcome of surgically treated IO at SPHMMC (From sept2016 To august 30,2017 G,C), (N=186)

Variables		Management outcome		p-value	AOR(95% CI)
		Mgt. outcome good	Mgt. outcome not good		
Length of hospital stay	≤7 days	99(53.2%)	9(4.8%)	0.04	2.5 (1.2, 3.6)*
	>7days	35(18.8%)	43(23.2%)		1
Duration of postoperative	≤48hrs	43(23.1%)	34(18.3%)	0.543	4(0.8 , 8.1)
	>48hrs	88(47.3%)	21(11.3%)		1

antibiotic					
Duration of sypt.	<=24hrs	66(35.5%)	26(13.9%)	0.518	6(0.7 , 13.1)
	>24hrs	61(32.8%)	33(17.8%)		1
Initial management	Resuscitation,iv antibiotic,NGT	81(43.6%)	32(17.2%)	0.012	0.5(0.3, 0.8)*
	Resuscitation,iv antibiotic	9(4.8%)	2(1.1%)	0.521	0.4 (0.2 , 0.7)
	Resuscitation,NGT[no antibiotic]	37(19.9%)	25(13.4%)		1

Chapter 6: Discussion:

Intestinal obstruction is a common surgical problem and accounts for a large percentage of surgical admissions for acute abdominal pain globally. Indeed, world wide it has been estimated that 1% of all hospitalizations ,35 of emergency surgical admissions to general hospitals and 45 of major colostomies are secondary to IO . It develops when air and secretions are prevented from passing through gastrointestinal tract as a result of either intrinsic or extrinsic compression (i.e., mechanical obstruction) or gastrointestinal paralysis (i.e., non mechanical obstruction in the form of ileus or pseudo-obstruction) [4].

Bowel obstruction has complex physiological derangements associated with it and is thus an important contributor to post-operative morbidity and mortality. The associated shock with haemoconcentration, hypovolaemia and electrolyte imbalance often results from: sequestration of fluid or blood into lumen, bowel wall and peritoneum, excessive vomiting and nasogastric suction and decreased oral intake. Patients may lose up to 4 – 8 liters of fluid (intra and extra vascular) and this continues to increase unless an appropriate early intervention is carried out [4, 8].

In our study, males constituted 72.04%[134] and females 27.96%(52) with male to female ratio 2.6:1. the age ranges from 16 year to 85 years with mean age of 42.9 and SD=18.5 .

Our study also revealed that patients who stayed for less than 7 days were less likely to develop unfavorable outcomes compared with patients who stayed for more than 7 days. By comparison, one study of pattern of acute abdomen in Butajira, Ethiopia showed that the average hospital stay was 9 days and a third of patients developed one or more acute complications [9, 20]. The difference in IO outcome may be associated with late duration of patients' illness to hospital due to lack of awareness about the burden and impacts of the problem. The potential reasons for lower mortality rate in our study may be due to early intervention of the obstruction before complications occur and adequate preoperative resuscitation which might be expected to decrease mortality. Only 77(41.4%) patients presented before 24 hours the onset of symptoms which is similar to other studies in Africa [2, 5, 15, 16]. Several factors could explain this delay. Poverty, ignorance, delayed referral from mid and low level health institutions, poor road infrastructures and lack of transport means are some of the most important ones. Late presentation in case of intestinal obstruction accounts for disastrous outcomes,

notably high rate of complications, long hospital stay and high mortality rates [2]. About 159[85.5%] of patients had all four cardinal symptoms, 27[14.5%] groin swelling 35 [18.8%] had abdominal pain and distention without vomiting. This is similar to other studies in our country as well as other African countries [7, 8, 14].

In this study adhesion band is the leading cause of intestinal obstruction which accounts 31(16.7%) followed by primary small bowel volvulus 28[15%] and hernia 27[14.5%]. This result is similar to other studies in developed countries but a little bit different from other studies in Ethiopia like BLH(52%) and Gondar(43.4%) university which put SBV as the leading cause of obstruction[1]. Other study in Hosanna SBV as the leading cause of obstruction. On the other hand research done at Yirgalem Hospital, shows that out of 229 cases of acute surgical abdomen (From Jan. to Dec. 1997) SBO ranked the 1st (mainly Small intestine Volvulus) [10] .

In this study adhesions band are the second cause of intestinal obstruction which accounts 31[16.7%]. Adhesions are a growing cause of intestinal obstruction in many centers in the developing world, including our country. Operative intervention for adhesive bowel obstruction frequently involves adhesiolysis but gangrene and/or multiple perforations due to adhesion bands occluding mesenteric vessels may warrant resection and anastomosis [13, 14, 5]. In this study, 2.7%[5] patients with adhesion required gut resection and anastomosis done. This is less compared than a study done in Northern Uganda showed 11 of 27 patients with adhesion required gut resection [5]

Sigmoid volvulus is an important leading cause of mechanical large intestinal obstruction accounting for 44(23.6%) in this study. Sigmoid volvulus was found to be the leading cause of bowel obstruction in Northern and central Ethiopia [13, 14], which in this study the leading cause as well. Similarly research done Hosanna hospital sigmoid volvulus is leading cause [5] . Complication of patients with sigmoid volvulus might have been increased if cases of sigmoid volvulus which were managed as an outpatient by simple rectal tube deflation were included.

Hernias are a leading cause of obstruction in most African countries .Groin hernias constitute about 75% of abdominal wall hernias. More prone to obstruction and/or strangulation and the earlier they are repaired, the better the outcome [2, 4, 5, 6, 7, 8]. In this study it is the 3rd leading causes, which accounts 27[14.5%]. Among this 20(10.7%) R/A plus herniorraphy done. It is less common cause of obstruction compare to other's the reason might be patients operate as electively before strangulation.

Neoplasm(obstructed tumor) , either of large or small gut are still an uncommon cause of bowel obstruction in many African centers [2, 5, 13]. Left sided colonic tumors commonly present with rectal bleeding and/or intestinal obstruction whereas right sided tumors may present with anemia and wasting except for those around the hepatic flexure which may present as closed loop obstruction in the presence of a competent ileo caecal valve [4,8,19].

In this study, only 5(2.7%) patients had tumor involving for both small bowel and large bowel obstruction , for all bowel resection done and discharged on palliative care after biopsy sent .In this series which is similar to other studies in central and southern Ethiopia as well as other studies in African countries [2,6,12, 13].

Overall, of the 186 patients operated on for bowel obstruction, 67[36%] had bowel resection and anastomosis. Volvulus was the most common indication for resection followed by strangulated hernia respectively . Resection rate in this series is lower than what found in Nigeria and Northern Uganda [2, 5, 6], from those who had bowel resection, 73 (91.3%), had reported 24 hours after onset of symptoms.

The rate of complication in this study is lower than the rate in southern and northern Ethiopia and other studies in Africa [5, 14]. Wound infection 25 (13.4%) was the commonly encountered complication followed by anastomotic leak 10(5.4%) and facial dehiscence 6(3.2%) . All 15(8.06%) died and most of the patients who develops sepsis and post operative complication had duration of illness greater than 24 hours. The mortality rate of a study in

Gondar is similar to our study, but a study in BLH(35.2%) and southern Ethiopia and most African countries reported higher mortality rate except a study done in a rural hospital in Ruanda which report a lower mortality rate of 6.7% [2, 5, 13, 14]. Our study also revealed that patients who stayed for more than 7 days were less likely to develop unfavorable outcomes compared with patients who stayed for more than 7 days. By comparison, one study of pattern of acute abdomen in Butajira, south Ethiopia showed that average hospital stay was 9 days and a third of patients developed one or more acute complications[9,20]. The difference in IO outcome may be associated with late duration of patients to hospital due to lack of awareness about burden and impacts of the problem.

In our study Initial management and Length of hospital stay had statistically significant association with management outcome surgically treated IO, with Adjusted odd ratio 0.5(0.3- 0.8), and 2.5(1.2-3.6) respectively. This means the odds of having bad outcome is 2.5 times higher among patients who stayed more than 7 days than their counterparts and those who were managed well initially (those who took all the three resuscitation, IV antibiotics, NGT) is 50% less likely to have poor management outcome compared to for those not managed well

Limitation and strength of the Study:

The advantages of this retrospective study include a relatively inexpensive ability to research the readily accessible existing data; easier access to conditions, allowing the study of rare occurrences; and most importantly, the generation of hypotheses that would be tested prospectively. However, the limitations of incomplete documentation, including missing charts, information that was unrecoverable or unrecorded, and difficulty in interpreting information found in some patients.

Chapter 7. Conclusions and recommendations:

Conclusions: -

In this study, the prevalence of intestinal obstruction is high[36.7%] among surgically treated acute abdomen and the outcome of surgically treated bowel obstruction may be affected by different factors. The study revealed that, total of 130(69.9%) had good management outcome.

Length of hospital stay and initial management were found to be independent predictors of management outcome of patients with intestinal obstruction.

It is therefore essential to identify and make appropriate decision on those patients who are at high risk of developing serious complications considering the reported factors so that it could help to reduce the observed mortality even if lower morbidity and mortality rates observed in our study compare to other, which can be explained by improvement in preoperative preparation. High mortality, complication and prolonged hospital stay were observed in patients with obstruction presented 24 hours after the onset of symptoms.

Recommendations:

Early diagnosis, adequate preoperative resuscitation, IV antibiotic, NG tube and proper post operative care should be done by health professionals to reduce complication and mortality due to IO.

This could be achieved by increasing public awareness on clinical features of intestinal obstruction as well as by improving the knowledge of mid and lower level health professionals on the diagnosis, resuscitation and importance of early referral to higher center.

Further research using prospective study design is warranted as a way to overcome the limitations of secondary data in the current retrospective research that preclude generalization to the whole population.

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ANNEX

CHECK LIST:

Research check list format for prevalence and management outcome of operated patients for IO from Sep1,2016 to august 30, 2017 G.C, at SPHMMC, Addis Ababa,ETHIOPIA,

I. Socio demographic profile:

1 .Age_____

2. Sex

1. Male

2. Female

3. Residence

1 Rural

2. Urban

4.region

II. Clinical presentations, findings and management

6. Presenting symptoms

1. Abdominal distention

2. Vomiting

3. Constipation

4. Abdominal pain

5. Groin swelling

6. Others_____

7. Duration of symptoms _____

8. Investigation done (can have more than one option)

1 . CBC and BG 2.plain abd x ray 3.others

9. Preoperative diagnosis

1. SBO

2. Simple LBO

3. Gangrenous SBO

4. Gangrenous LBO

5. Incarcerated hernia .

6. Others specify_____

10. Initial managements performed

1. Resuscitation with IV crystalloids
2. NGT insert
3. IV antibiotic initiated
4. Others, specify_____

11. If antibiotic initiated specify name of the drug(s) _____

12. Operative findings

1. Sigmoid volvulus (simple)
2. Sigmoid volvulus (gangrenous)
3. SBV (simple)
4. SBV (gangrenous)
5. incarcerated hernia
6. strangulated hernia
7. Adhesion & Bands
8. Intussception
9. Others specify (Malignancy or obstructing tumors).

13. Procedure done during operative management

1. Untwisting the volvulus
- 2 .R& Anastomosis
3. Hartman's colostomy
- 4 .Herniorrhaphy
5. Adhesionolysis
- 6 .Others (specify)_____

14. Name & duration of post operative antibiotics _____

15. Length of Hospital Stay in day _____

16. Any Post operative complication

1. Hematoma/serosa
2. Superficial incisional SSI
3. Deep incisional SSI
- 4 .organ/space SSI (Anastomotic leak)
5. Facial dehiscence
7. Others specify_____

17. When was the complication detected?

1. within 4th post op day
2. between 4th and 8th day

3. After 8th day

18. Condition at discharge:

1. Discharged alive without complication
2. Discharged alive with at least one complication
3. Died in the hospital