PATTERN OF INTESTINAL OBSTRUCTION AMONG ADULT OPERATED PATIENTS IN JIMMA UNIVERSITY SPECIALIZED HOSPITAL, A TWO YEARS RETROSPECTIVE REVIEW, JIMMA, SOUTH WEST, ETHIOPIA.

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JIMMA, ETHIOPIA

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ABSTRACT

Background: Intestinal obstruction is a commonly encountered emergency in the practice of General Surgery and accounts for large percentage of abdominal emergencies and surgical admissions. When intestinal obstruction is not relieved in time, the patient may die. Early diagnosis and prompt management are therefore mandatory. Several factors contribute to poor out comes in the case of intestinal obstruction. Some of this determinant may include poor health care seeking behavior, ignorance and poverty. The pattern of intestinal obstruction is an indicator of how well surgical services are developed in a certain region. Intestinal obstruction can be caused by many conditions that vary from country to country, from area to area within the same country. But there is no much study regarding the pattern and magnitude of intestinal obstruction in Ethiopia at large and Jimma University Specialized Hospital in particular.

Objective: To assess the pattern of intestinal obstruction in adult operated patients in Jimma University Specialized Hospital.

Methods: A two year retrospective, institution based cross sectional descriptive study was carried out in Jimma University Specialized Hospital by reviewing patient's records, which were admitted and operated in a period from January 1, 2010 to December 31, 2011. The data was analyzed using SPSS version 16 and the results were displayed using frequency tables and figures. For all statistical significance test, the cutoff value set is $P<0.05$ as this was considered statistically reliable for the analysis of the study. Crude odds ratios of variables whose statistical significance values are <0.05 were checked in the binary logistic regression.

Results: A total of 323 patients were admitted with a diagnosis of intestinal obstruction of whom the records of 248 patients were found and 216 patients were included which made the basis of this study. The male to female ratio was 2.8:1. The ages ranged from14 years to 73 years with a mean age of 38.3$\pm$3.88. Small bowel volvulus accounting for 33.3% of cases was the leading cause of intestinal obstruction followed by hernias (15.4%) and sigmoid volvulus (14.5%). There were 26 deaths giving an overall mortality of 12%. A higher mortality rate was observed in patients who presented late.

Conclusion and Recommendations: Intestinal obstruction deserving emergency surgical management is quite common in Jimma University Specialized Hospital which is in line with earlier reports from Africa had shown. Small bowel volvulus was found to be the leading cause of intestinal obstruction in this study. The over all mortality of 12% is high and could be attributed to late presentation. Early diagnosis, adequate pre operative resuscitation and proper post operative care would be achieved by increasing public awareness on 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. More over, health facilities capable of handling patients with intestinal obstruction should be available with in the reach of the community.

Key words: Intestinal obstruction, Jimma University Specialized Hospital

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LIST OF ABBREVIATIONS

AOR……Adjusted odds ratio

COR……Crude odds ratio

Ft…….Feet

GI……Gastro intestinal

HO_s……..Health officers

IEOS……... Integrated emergency obstetrics, gynecology and Surgery

IO…….....Intestinal obstruction

JUSH…….Jimma University Specialized Hospital

Kms……..Kilometers

LBO……. Large bowel obstruction

MOH…….Ministry of Health

NGOs…… Non-governmental organizations

OPD…….. Outpatient department

OR…….Odds ratio

OT…….Operation Theater

PI……Principal investigator

RHB……Regional health bureau

SBO…… Small bowel volvulus

SPSS……Statistical package for social sciences

SV……Sigmoid volvulus

WHO……...World Health Organization

X^2……Chi square

CHAPTER-ONE INTRODUCTION

1.1 Background

Intestinal obstruction is one of the commonest abdominal surgical emergencies worldwide. When intestinal obstruction is not relieved in time, the patient may die. Early diagnosis and prompt management are therefore mandatory. Several factors contribute to poor out comes in the case of intestinal obstruction. Some of these determinants may include poor health care seeking behavior, ignorance and poverty. Poor clinical judgment is also one of the negative factors leading to poor prognosis in case of intestinal obstruction (1).

Intestinal obstruction can be caused by many conditions that vary from country to country, from area to area within the same country and at different times. The outcome of management of the condition may be a good indicator of how well a country's surgical services are doing. Little is known about the spectrum of intestinal obstruction in our environment. In a previous report from the United Kingdom, between 1925 and 1930 fifty percent of bowel obstruction was due to strangulated hernias followed by malignancy (23%) and adhesions (7%). However in a study between 1942 and 1945, the picture had changed and adhesions were found to be the commonest cause of IO (31%), followed by malignancies (27%) and strangulated hernia (10%). In rural Africa, acute intestinal obstruction accounts for a great proportion of morbidity and mortality (2).

Acute appendicitis is the most frequently seen cause of acute abdomen in developed world. The leading cause of intestinal obstruction in Africans has mostly been hernia and volvulus whereas, adhesions are most frequent in the developed world. There are however, some African studies which are pointing to a change in these established patterns (3). Little has been reported about intestinal obstruction in Ethiopia. According to the few reports available from northern and central Ethiopia, sigmoid volvulus was the leading cause of intestinal obstruction (3).

A study done in Ethiopia in Tikur Anbessa Hospital in 2006, showed that intestinal obstruction was the second leading cause of acute abdomen preceded by acute appendicitis(3). Intestinal obstruction has been the leading cause of acute abdomen in several African countries but in Ethiopia very little is known about the general pattern and the relative incidence of the causes of intestinal obstruction(3). Hence this study will be conducted with the aim of assessing the magnitude, pattern and outcome of surgical treatment of IO in JUSH.

1.2 Statement of the Problem

Intestinal obstruction is defined as partial or complete blockage of intestine producing symptoms of vomiting, constipation, abdominal distention and abdominal pain. IO is one of the common abdominal emergencies and in some communities the most common like in developing countries. Unfortunately, a patient with IO presents late, so that they may present with dehydration, hypovolemia, oliguria and shocked. The clinician may face difficulty in deciding that the patient is obstructed. Because of this intestinal obstruction is said that it is one of the challenges in medicine. Intestinal obstruction develops when air and secretions are prevented from passing distally as a result of either intrinsic or extrinsic compression. The incidence of IO in USA was 0.13%. Even though the general incidence of IO seems the same in USA and Ethiopia the causes are different i.e. cancer and adhesions are the leading causes in developed world and on the other hand sigmoid volvulus and strangulated hernias are the main causes in developing world (4).

In Tikur Anbessa Hospital IO accounts for 26% of all acute abdomen. (3) Intestinal obstruction leads to proximal dilatation of the bowel and disrupts peristalsis. Bowel above the obstruction becomes distended with fluid and gas. This stimulates excessive peristalsis producing colicky pain. As distention increases with time blood vessels in the bowel will be stretched and narrowed impairing blood flow and leading to ischemia. Absorptive capacity of the gut decreases and with a net increase of water and electrolyte secretion in to the lumen. (3, 4, 5)

There will be increased vomiting which leads to depletion of extracellular fluid which eventually leads to hypovolemia and dehydration. A strangulated loop dies and perforates to produce severe bacterial peritonitis which is often fatal. Grossly distended abdomen restricts diaphragmatic movement and interferes with respiration (4, 5).

A multiple organ failure will subsequently result if the strangulated loop is not removed. One of the many ways in which the industrial and the developed world's differ is the way in which the guts of their inhabitants obstruct. This difference between developed and developing countries result in higher rate of morbidity and mortality in Africa and other developing countries. (6)

It has been well documented in the literature that the pattern of intestinal obstruction varies from country to country and varies from time to time in the same country. This study aimed to reveal the pattern of IO in JUSH.

1.3 Significance of the Study

Scientific knowledge is the cumulative effect of many researchers. As the time goes peoples are trying to search for conditions that can help to change their environment and life style. In such a way that living in this world will be simple and attractive. Therefore Studying pattern of intestinal obstruction among adult operated Patients in JUSH, South West Ethiopia may help to fill the information gap about intestinal obstruction in health care practitioners in understanding the Spectrum, cause and commonest complications of intestinal obstruction in our set up.

It may also helps in determining the quality of health services in our set up.

This study believed could have epidemiological benefits and will serve as a base for other studies. As a result the findings of this study could help to identify the pattern of IO in JUSH.

CHAPTER- TWO LITERATURE REVIEW

Intestinal obstruction is one of the leading causes of acute abdomen worldwide in general and in Africa and other developing countries in particular. It is contributing to increased number of morbidity and mortality. One study done in Ghana on pattern of intestinal obstruction on one hundred and five patients aged between 1 month and 80 years (mean age of 31.8 years) were operated on for intestinal obstruction. There were 76 males (72.4%) and 29 females (27.6%) and the male to female ratio was 2.6:1. Eighty two patients (78.1%) presented more than 24 hours after the onset of the symptoms. The average duration of symptoms was 3.5 days (this ranged from 12 hours up to 20 days). Inguinal hernias were the leading cause of intestinal obstruction followed by intussusceptions. Adhesions occupied the third position. Two patients with obstructive adhesions were successfully treated non operatively. Thirty eight patients had intestinal resection followed by anastomosis. The rate of intestinal resection was 36.2%. The highest rates (more than 80%) of resection were observed in sigmoid volvulus, internal hernias, caecal volvulus and ileosigmoid knotting. Six (5.7%) patients who died had reported more than 24 hours after the onset of the symptoms. Only one (0.95%) patient died among those who reported before 24 hours after the onset of the symptoms. The overall mortality rate was (6.7%). Four (3.8) patients who died had intussusceptions (6).

In Nigeria seventy six cases were studied for intestinal obstruction. Among this 51 were males and 25 females giving a male to female ratio of 2:1. Peak age incidence was in the first decade of life (33.7) with equal distribution between the third and seventh decades. The major complaints were abdominal pain (90%), abdominal distention (85%), vomiting (71.2%), constipation (65%), abdominal tenderness (97%), 43% showed evidence of systemic toxicity. Seventy five (98.68%) had surgery and 42(55.26%) had resection of gangrenous bowel (8).

Among all emergency operations performed in rural hospitals of East Africa by medical officer's small bowel resection accounts for 45% and large bowel resection accounts 17 % (21).

The seasonal pattern of intestinal obstruction was observed in north western Ethiopia and the prevalence was significantly higher during the months of June through October (winter and spring) than during the months of November to May (autumn and summer). Although the

seasons for seasonal variations are uncertain, the seasonal activities of the young farmers who are more commonly affected may be responsible (20).

Other study done in rural areas of Kenya on small bowel obstruction, the frequency of small bowel obstruction due to adhesion and sigmoid volvulus were the leading causes of intestinal obstruction each accounting 27%. The mean duration of presentation was 8 days. Twenty four were males and 15 were females. The mean age group of the patients was 31.5 years. Seven out of 33 patients with small bowel obstruction had died giving a mortality rate of 21.2%. Among the patients having small intestinal obstruction secondary to adhesion (17/33), nine were males and eight were females. And 12 of them had previous surgery. Four were managed conservatively and 13 were operated out of which four had died. There were 8 patients with primary small bowel volvulus of whom 6 were males and 2 females; and all had recovered. There were 3 cases of primary intussusceptions and all presented late and all of them succumbed after surgery (9).

One study done in southern Ethiopia, Yirgalem showed among two hundred thirty five patients operated on for acute intestinal obstruction of which 98(41.7%) cases (88 males and 10 females) had small intestinal volvulus. The male to female ratio was 8.8:1. The age ranged from 16 to 65 years with a mean of 31.4. The peak age of occurrence was between 20 and 40 years which constituted 63% of patients. Sigmoid volvulus was encountered in 13.6%. Post operative adhesions occurred in 11.9%, and intussusception was seen in 8.5% of the cases. The infrequent cases included tuberculous adhesions, bands, colonic cancer, ileosigmoid knotting, strangulated hernia and caecal volvulus. Miscellaneous causes of intestinal obstruction were ascaris bolus in two of the cases, ileal stenosis in one case, long appendix encircling the bended lower segment of the ileum in one case and internal hernia through a mesenteric defect in one patient (7).

In Uganda a total of 44 cases were studied having ileosigmoid knotting. The patients age ranged from 16 to 80 years, with a mean of 52.2 (SD+_15.98) and mode of 60 years. The peak age was 51-60 years for males and 41-50years for females. Two patients (4.5%) died after the operation who presented after 24 hours (24).

In Tropical African countries the frequency of sigmoid volvulus rose with increasing age and this was more so for the males. Males account for 84% of cases; the male to female ratio was 5.3:1. Sigmoid volvulus is often associated with high mortality because it affects elderly patients who may have severe co-morbid conditions. The highest mortality usually occurs in cases of resection and primary anastomosis of gangrenous sigmoid colon. Most authors have reported a high mortality of sigmoid volvulus varying between 6% to 64% but this depend on whether there was gangrene, perforation, emergency surgery, toxic shock post operatively, co-morbid conditions and other post operative complications. However, the complication of anastomotic failure frequently seen n sigmoid colonic surgery may be related to chronic ischemia in sigmoid volvulus other than the surgical technique (14).

The frequency of small bowel obstruction due to adhesion and sigmoid volvulus were the leading causes of intestinal obstruction in Gonder, each accounting 27%. The mean duration of presentation was 8 days. Twenty four were males and 15 were females. The mean age group of the patients was 31.5 years. Seven out of 33 patients with small bowel obstruction had died giving a mortality rate of 21.2%. Among the patients having small intestinal obstruction secondary to adhesion (17/33), nine were males and eight were females. And 12 of them had previous surgery. Four were managed conservatively and 13 were operated out of which four had died. There were 8 patients with primary small bowel volvulus of whom 6 were males and 2 females; and all had recovered. There were 3 cases of primary intussusceptions and all presented late and all of them succumbed after surgery (15).

In a study done in North West Ethiopia, Sigmoid volvulus was the leading cause of colonic obstruction (17/29). Fourteen were males and 3 were females. Their ages ranged from 40-78 years and the mean age was 58 $\pm$ 11.4 years. The average duration of illness at presentation was 4.5 $\pm$ 2.1 days. Seven had simple volvulus and 10 had gangrenous volvulus(16).

Three of the patients with gangrenous sigmoid volvulus died before surgery and two died after surgery. One of the patients with simple sigmoid volvulus died after simple derotation by laparotomy. In total 6(35%) patients with sigmoid volvulus died (16).

A Study done in Obafemi Awolowo Teaching Hospital showed adhesive intestinal obstruction was the commonest cause of symptoms in 44%, followed by volvulus in 14%, and external hernias in 11% of patients. A correct pre operative diagnosis was made in over 70% of patients. Out of those with adhesive obstruction, 75% had previous abdominal or groin operation. While 57% had surgical exploration for failed conservative management. The mean duration of hospital stay was 6 days. And the overall mortality rate was 20% (17).

Other study in Nigeria revealed the commonest causes of intestinal obstruction to be strangulated hernia and adhesive bands. There was one case of Meckel's diverticulum causing ileal volvulus; one case of mesenteric thrombosis in adult sickler and a case of fecal impaction with no organic cause. And the commonest post operative complication following intestinal obstruction was burst abdomen in four percent of patients. There was one anastomotic leakage; one fecal fistula; two transfusion reactions. Two had prolonged paralytic ileus. On the whole there due to conditions not directly related to the primary condition, one had anesthetic death, one had cerebrovascular accident while recovering from surgery and died (10).

Also other studies showed the commonest complication in the post operative period following surgery for intestinal obstruction were sepsis, wound infection, pneumonia, and paralytic ileus (19).

CHAPTER –THREE OBJECTIVES

3.1. General Objective

- To assess the pattern of intestinal obstruction in adult operated patients in Jimma University specialized Hospital, Jimma, South West Ethiopia.

3.2. Specific Objectives

- To assess intestinal obstruction distribution among different socio-demographic characteristic groups.
- To identify the commonest causes of intestinal obstruction.
- To assess the operative management of patients.
- To assess the outcome of the patients.

CHAPTER FOUR - METHODOLOGY

4.1. Study Area and Period

The study was conducted in Jimma University specialized Hospital which is located in Oromia regional state, south West, Ethiopia, and is 352 kms away from Addis Ababa covering 167 hectares. The altitude of the town is 1676 ft above sea level, 7, 6667 (740'0.o12''N) latitude and 36, 8333 (3649'59.880"E) longitude. Administratively the town is divided in to 13 kebeles and the population of the town is estimated to be 128,330(census 2007). JUSH is one of the oldest public hospitals in the country. It was established in 1930 E.C by Italian invaders for the service of their soldiers. It is the only teaching and referral Hospital in South west Ethiopia with a total bed capacity of 450 and a total of more than 750 staffs both supportive and professionals. It provides approximately 9000 inpatient and 80,000 outpatient attendances per year coming to the Hospital from the catchment population of about 10 million people. The surgical department is one of the actively serving departments giving emergency and elective services among the services given by the Hospital with a capacity of 117 beds.

The study was conducted from February 16-28, 2012G.C

4.2. Study Design

The design of the study is descriptive institution based retrospective cross sectional study.

4.3 Population

4.3.1 Source Population

The source population of the study is all patients who were diagnosed to have acute abdomen.

4.3.2 Study Population

All operated Patients with a diagnosis of intestinal obstruction seen from January 1, 2010 to December 31, 2011G.C

4.3.3 Study Unit

Adult operated patients with the diagnosis of intestinal obstruction and their charts include full information.

4.4 Sample Size determination

The records of all adult patients with intestinal obstruction admitted and operated in a two year period, i.e. from January 1, 2010 to December 31, 2011 were reviewed.

4.5 Inclusion and Exclusion Criteria

Inclusion criteria

- Adult operated and registered patients on surgical log books with a diagnosis of intestinal obstruction and their charts having complete information.

Exclusion criteria

- Patients with incomplete items (information).

4.6 Measurement (Variables)

4.6.1 Dependent Variable

- Outcome of patients

4.6.2 Independent variables

- Age
- Sex
- Address
- Chief complain
- Duration of onset
- Signs and symptoms
- Diagnosis
- Intra operative finding
- Type of operation
- Post operative course
- Type of complication/s
- Length of Hospital stay
- Cause of death

4.6.3 Operational Definitions of Terms

Adult – a person greater than the age of 14.

Cause of death- a factor which made the patient to succumb.

Complications- patients' morbidity in the post operative period.

Expired patients- death of the patients who were operated for intestinal obstruction and Died in this Hospital.

Intestinal obstruction- blockage of the gut partially or completely.

Incomplete item- Patients charts not containing full information.

Length of Hospital stay- days elapsed when the patient is in the Hospital.

Outcome- condition of the patient at discharge.

4.7 Data Collection

4.7.1 Data Collection Instruments

The data was collected by trained health professional data collectors(nurses) by using a pre structured format and the data were collected from the patients chart, inpatient and OT records, admission and discharge books. The data were collected from February 14 – 28, 2012. Data concerning socio demographic characteristics, duration of illness, presenting symptoms and signs, diagnosis, operative findings, post operative course, type of complication/s, outcome and length of hospital stay were extracted and filled in a pre prepared format.

4.7.2 Data Collection Procedure

Training was given to the data collectors by the PI for two consecutive days before data collection Started on how to fill the pre prepared checklist and the importance of the quality of the data. Five diploma holder clinical nurses were involved in collection of data. Two first degree holder HO_s were supervising the daily activity, consistency and completeness of the filled checklist and were giving appropriate support during the data collection process. The PI was checking the daily activities of supervisors and the data collectors.

4.7.3 Data Quality Control

To assure the quality of the data, data collectors and supervisors were trained and a regular supervision and follow up was made by Supervisors and PI. In addition regular checkup for completeness and consistency of the data was made on daily basis.

4.7.4 Data Processing and Analysis

Data concerning socio demographic characteristics, duration of illness, presenting symptoms and signs, diagnosis, operative findings, type of operation done, post operative course, outcome and length of Hospital stay were extracted and after the data was entered cleaned analyzed by using SPSS version 16 and the results were displayed using frequency tables, figures and charts.

The socio demographic data was summarized and presented by using graphs, tables and other summery measures. For all statistical significance test, the cutoff value set is $P<0.05$ as this was considered statistically reliable for the analysis of the study.

Crude odds ratios of variables whose statistical significance values are <0.05 were checked in the binary logistic regression.

4.9 Ethical Consideration

Ethical permission to undertake the study was obtained from ethical committee of Jimma University. Letter of cooperation was given to different authorities of the Hospital and as well informed consent will be obtained from surgical department head of JUSH. The information found in the patient's charts was kept secured and the information is used only for this study purpose and finally the charts were returned back to the record office.

4.8 Dissemination and Utilization of the Result

Based on the results obtained conclusions and recommendations were made. Then the results of the study will be submitted to Jimma University College of public health and medical sciences, IEOS coordinating office, JUSH, Oromia regional health bureau, and other responsible or interested organizations. The results were presented during thesis defense as a partial fulfillment of degree of MSc in IEOS and trials will be made to present in different seminars, meetings, conferences and workshops. Moreover, efforts will be made to publish the findings of the study on journals and scientific publications.

CHAPTER FIVE- RESULTS

Socio demographic characteristics

A total of 767 adults with acute abdomen were operated in the study period. Out of this three hundred and twenty three adult patients were having intestinal obstruction which is 42% of all cases of acute abdomen. Out of which records of 248 patients found and charts of 216 patients were retrieved for analysis. The over all retrieval rate of charts was 76.8%.

There were 159(73.6%) males and 57(26.4%) females. The male to female ratio is 2.8:1. Their age ranged from 14-73 years. Age of 29(13.4%) ranged from 14-23years, 62(28.7%) were 24-33 years which is this group accounted larger number than the other age groups, 50(23.1%) were 34-43 years old, 43(19.9%) ranged from 44-53 years old, 22(10.2%) were 54-63 years old and the rest 10(4.6%) were ≥64 years of age. (See figure 1). The mean age in this series was 38.3 ± 3.9 years.

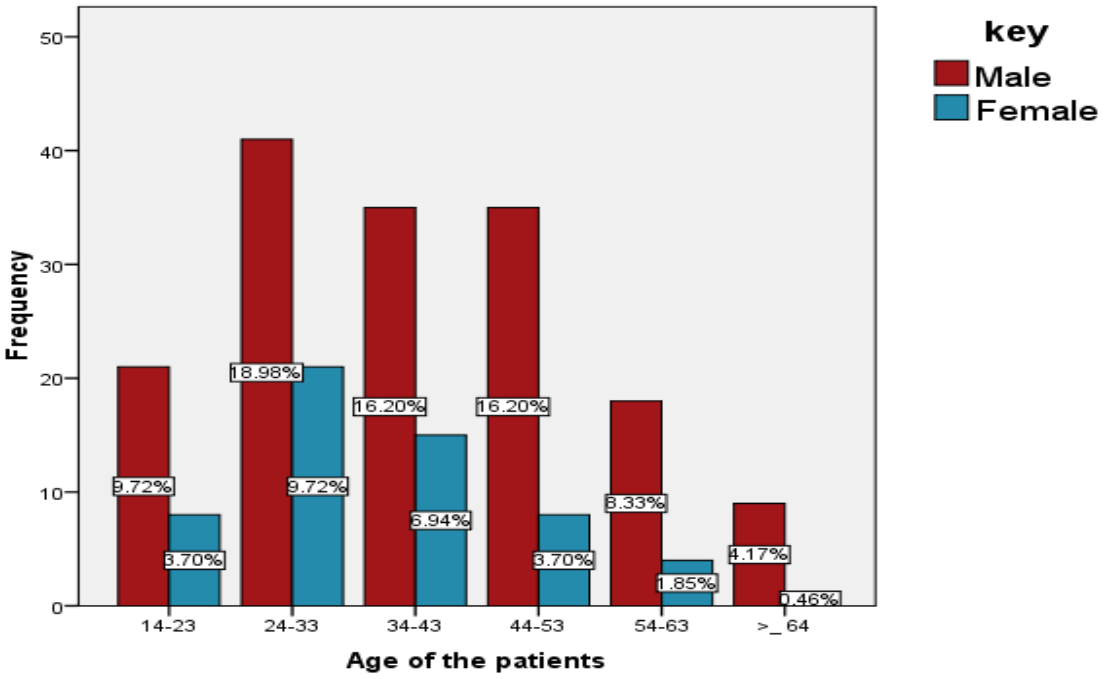

Figure1. Age and sex distribution of adult operated patients for intestinal obstruction in JUSH from Jan 1, 2010-Dec 31, 2011 (n=216)

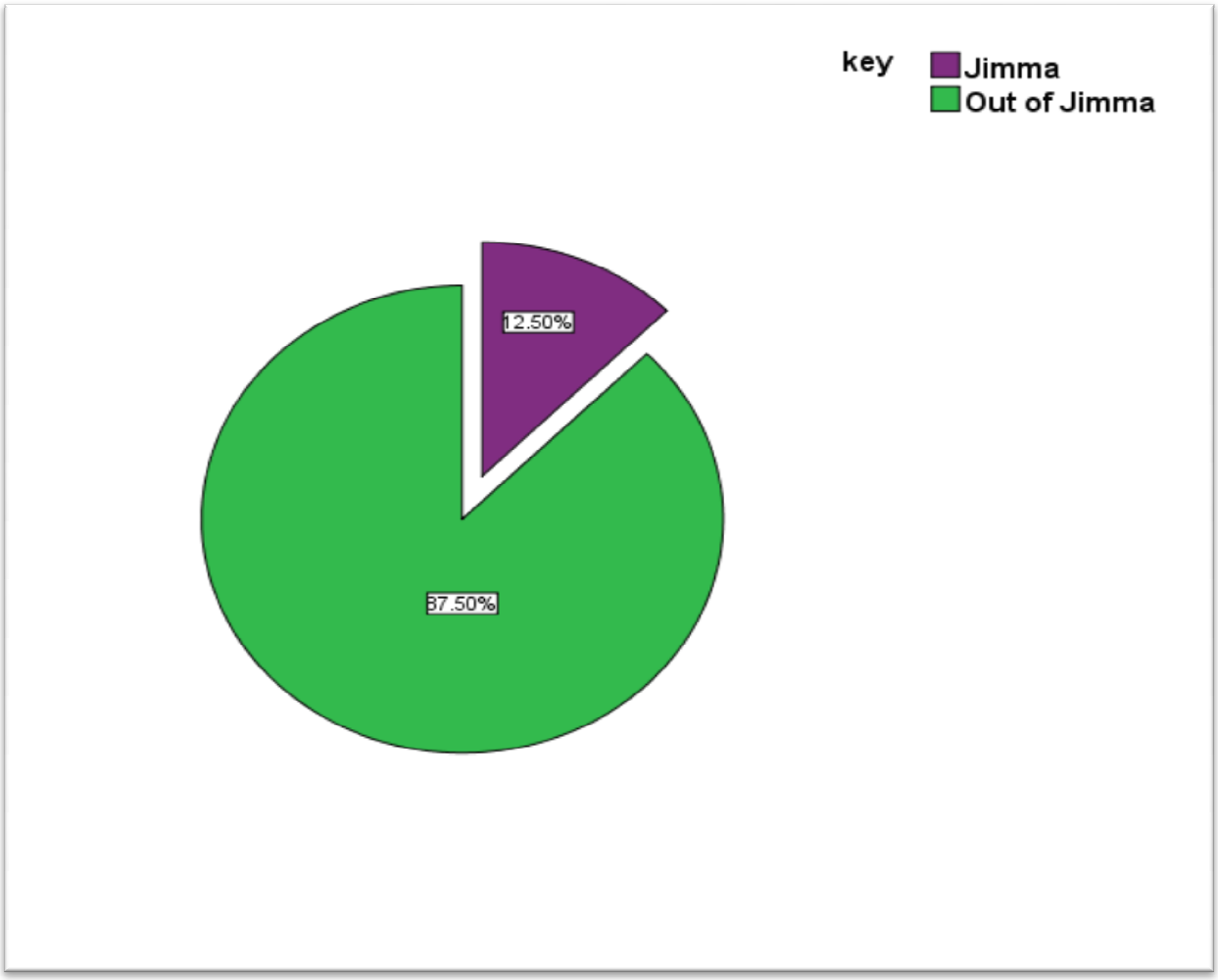

Figure2. Address of adult operated patients for intestinal obstruction in JUSH from Jan 1, 2010-Dec 31, 2011 (n=216)

Majority of surgically treated patients with intestinal obstruction were from out side of Jimma town accounting 189(87.5%) and 27(12.5%) reside in Jimma town.(see figure 2 above)

Clinical features and Characteristics

Ninety six (44.4%) of patients reached to JUSH within 48 hours after onset of symptoms and 120(55.6%) reached after 48 hours.

Table 1. Duration of onset Vs out come of adult operated patients for intestinal obstruction

In JUSH from Jan 1, 2010-Dec 31, 2011 (n=216)

Variables		Outcome of the patients				Total
		Discharged improved		Expired		
		No.	%	No.	%	
Duration of onset of symptoms in hours	<48 hours	89	92.7	7	7.3	96
	>48 hours	101	84.1	19	15.9	120
Total		190		26		216

All of the patients included in this study had abdominal pain at presentation, vomiting (88%), abdominal distension (70%) and constipation (64%) which were the commonest symptoms in patients with intestinal obstruction.

On physical finding 118(54.6%) had distended abdomen, 58(27%) had tender abdomen, 26(12%) had mass and the rest 14(6.5%) had other findings like visible peristalsis, empty rectum and so on.

Small bowel obstruction was the leading cause of intestinal obstruction than large bowel obstruction. SBO accounted for 75.5% and large bowel obstruction accounted for 24.5%. In this study 72(33.3%) had small bowel volvulus of which 59 males and 13 females, 33(15.3%) had different types of hernias of which 23 were males and 10 females, 23(10.6%) had intussusception of which 12 females and 11 males, 19(8.8%) had obstructing band, 16(7.4%) had adhesion of which 10 had previous abdominal surgery and six had tuberculous adhesion.

Thirty two (14.8%) had sigmoid volvulus among this 25 were males and seven were females. 11(5.1%) had an ileosigmoid knotting of which six were males and five were females. Cecal volvulus, transverse colon volvulus, colonic carcinomas and tumors accounted for the rest 10%.

Table 2. Causes of intestinal obstruction in adult operated patients for intestinal

In JUSH from Jan 1, 2010-Dec 31, 2011 (n=216)

Causes	Frequency	Sex				%
		Male		Female		
		No	%	No	%	
Small bowel volvulus	72	59	81.9	13	18.1	33.3
Hernias*	33	23	69.7	10	30.3	15.3
Sigmoid volvulus	32	25	78.2	7	21.8	14.8
Intussusception	23	11	47.9	12	52.1	10.6
Band	19	15	79	4	21	8.4
Adhesion	16	12	75	4	25	7.4
Ileo sigmoid knotting	11	6	54.6	5	45.4	5.1
Others**	10	8	80	2	20	4.8
Total	216	159	74.6	57	26.3	100

Hernias* inguinal hernia, femoral hernia, epigastric hernia, umbilical and paraumblical

Others** transverse colon volvulus, cecal volvulus, colonic ca, and tumors.

Intra operatively 74(34.3%) of patients had gangrenous bowel and for 65(87.8%) of them primary resection and anastomosis was done of which 7(10.7%) had post operative complication by anastomotic leakage, for 18(24.3 %) colostomy was done. Out of 26 patients who succumbed post operatively 18(69.2%) had gangrenous bowel.

In 157 patients the post operative period was smooth whereas, Fifty nine (27.3%) of patients had post operative complications and the leading cause of post operative complication was sepsis in which 12(20.3%) patients had it out of all complications seen, 9(15.2%) had pneumonia, 8(13.5%) had wound infection, 7(11.8%) of patients had anastomotic leakage. Other complications seen were complete wound dehiscence, paralytic ileus, aspiration pneumonia and other anesthesia related complications. The mortality rate in patients who had post operative complication was 24(92.3%).

Table 3. Frequency of complications among patients operated for intestinal obstruction

In JUSH from Jan 1, 2010-Dec 31, 2011 (n=59)

Complication	Frequency	Percent
Sepsis	12	20.3
wound infection	8	13.5
wound dehiscence	6	10.1
Pneumonia	9	15.2
aspiration pneumonia	4	6.7
paralytic ileus	6	10.1
anastomotic leak	7	11.8
Others*	8	13.5
Total	59	100

Others*- pulmonary edema, ARDS, short bowel syndrome, intra abdominal collections, Pericolostomy hernia, anemia, colostomy necrosis

Twenty six (12%) of patients with intestinal obstruction succumbed post operatively. The leading cause of death in 17(65.3%) was septic shock which resulting in multi organ failure, 3(11.5%) respiratory failure, 2(7.6%) died of cardiac arrest, the rest 4(15.3%) constitute anesthesia related deaths, pulmonary embolism and ARF.

Table 4. Causes of death among adult operated patients for intestinal obstruction in JUSH from Jan 1, 2010-Dec 31, 2011 (n=26)

Causes of death	Frequency	Percent
septic shock	17	65.3
respiratory failure	3	11.5
cardiac arrest	2	7.6
Others*	4	15.3
Total	26	100.0

Others* pulmonary embolism, anesthesia related deaths, ARF

Fifty six (25.9%) of patients stayed <5 days in Hospital, 119(55.1%) stayed 5-9 days, 30 (13.9%) stayed 10-14 days, 11(5.1%) stayed for longer than 14 days. The mean duration of Hospital stay was 6.88 days.

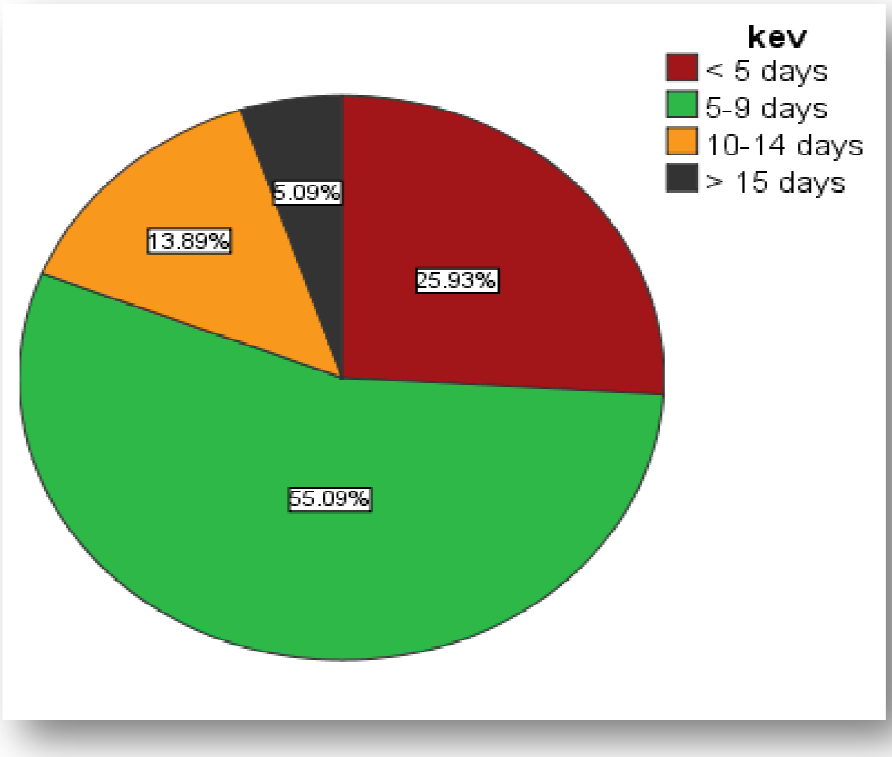

Figure3. Length of Hospital stay in adult operated patients for intestinal obstruction in JUSH from Jan 1, 2010-Dec 31, 2011 (n=216)

Measures of association between outcome of the patients and independent variables.

When the association between the dependent variable (outcome of patients) and independent variables assessed, the results revealed that there was a significant association between outcome of patients and age of the patients [x^2 =17.49, p-value= 0.04].

There was also a significant association in outcome of the patients and intra operative findings [x^2 =15.862, p-value=0.001].

The study shows a significant association in outcome of patients and type of operation done [x^2 =19.151, p-value=0.008].

The results also revealed that there was a significant association between outcome of the patients and post operative period[x^2 =62.887, p-value=0.000].

Table5. Measure of association between outcome of patients and independent variables.

S.No	Variables	Patients out come		X^2	p-value
		Expired	Discharged improved		
		No.	No		
1.	Age of the patients 14-23 24-33 34-43 44-53 54-63 ≥64	 1 5 6 4 8 2	 29 56 44 39 14 8	x^2 =17.49	0.004
2.	Intra operative finding Gangrenous bowel Viable bowel	 18 8	 57 133	x^2 =15.862	0.001
3.	Post operative period Smooth Complicated	 2 24	 155 35	x^2 =19.151	0.000
4.	Complication Yes No	 24 2	 36 154	x^2 =62.887	0.000

Binary and Multiple logistic regression of outcome of patients and independent variables

Binary logistic regression was made for each independent variable with the dependent variable. Finally intra operative finding, post operative period and complications becomes significant with p-value <0.05 with out come of the patients.

After selecting the significant independent variables with the dependent variable multiple logistic regression was made; intra operative findings and post operative period becomes more significant with out come of the patients at p-value <0.05.

Patients who had gangrenous bowel intra operatively were 0.19 times more prone to succumb as compared with those had viable bowel intra operatively (COR=0.19, 95% CI of [0.078-0.463].

Patients with complicated post operative period were 53 times more likely to die as compared with those who do not have post operative complication (COR=53, 95% CI of [11.9,235.4].

Table 6. Binary and logistic regression of outcome of patients and independent variables.

S. No	Variables	Patients out come		COR [95% CI]	AOR [95% CI]
		Expired	Discharged Improved		
		No (%)	No (%)		
1.	Intra operative finding			0.19 [0.078,0.463]	0.508 [0.181,1.437]
	Gangrenous bowel	18(69.2)	57(30)		
	Viable bowel	8(30.7)	133(70)		
2.	Post operative period			53.143 [11.9,235.4]	1.41 [9.270,193.79]
	Smooth	2(7.7)	155(81.5)		
	Complicated	24(92.3)	35(18.5)		

CHAPTER SIX -DISCUSSION

Acute intestinal obstruction is a global problem consuming much in terms of surgical services. Studies done locally and internationally have determined the magnitude of the problems, the pattern and symptomatology which have differed over time. Diagnosis and treatment modalities reflect a lot of local factors and peculiarities (facilities available and the propensities of managing teams). However, most agree that the key to achieving good results is aggressive resuscitation and prompt surgical intervention to relieve the obstruction (1).

About 80 years ago, Mr. Hamilton Bailey used to say "The sun should not both rise and set on unrelieved case of intestinal obstruction." With early diagnosis and prompt appropriate management, most of patients suffering from intestinal obstruction can be saved. The situation is quite very different most of the time. Some patients come after subjecting themselves to relatively long periods of observation. They usually present to health professionals when they really feel very sick (2).

There are very few studies done on the general pattern of acute abdomen in general and intestinal obstruction in particular in Ethiopia (3).

In this series the male to female ratio was 2.8:1 and the majority of patients were in their 2nd and 3rd decades of life, which is in agreement with previous studies done in the country as in a study conducted by B. Kotiso et al[(3)]. Which is 2.6:1.And the mean age of the patients was 38.7 years whereas, 31.8 years as in Ntakiyiruta et al (1).

Most patients in this series were males who reside out of Jimma in rural areas accounting for 87.5% of all patients. This agrees to the fact that this problem is common in rural population unlike acute appendicitis which is common in urban settings (3).

The majority of patients reported more than 48 hours after onset of symptoms (55.6%) which is in agreement with a study done in Kibogola Hospital, Ruanda. Several factors could explain this delay. Poverty, ignorance, poor infrastructures and lack of transport means are some of the important ones. Late presentation in case of intestinal obstruction accounts for disastrous out comes, notably high rate of complications, long hospital stay and high mortality rates (1).

Small bowel volvulus was the leading cause of intestinal obstruction accounting for (33.3%).This is in agreement with other study done in the southern part of the country (7). However, B.Kotiso et al (3) and other study in northern part of Ethiopia found sigmoid volvulus and small bowel adhesion were the leading cause of intestinal obstruction each constituting 27.4%.

Different types of obstructed/strangulated hernias were the second leading causes of IO in this study by accounting 15.3% of all cases of intestinal obstruction. This is not surprising because very few hernias are actually being repaired on an elective basis. There are many reasons why people do not have elective hernia repairs. The medical expenses were deemed very high and the community has no health insurance are some of the reasons. As long as the hernia was not obstructed this was not top priority. It is also noteworthy to mention that absence of surgical expertise at the nearby Hospital is a major barrier as well. The surgical expertise at district hospital level did not change accordingly however.

When surgical services are improved hernias are electively repaired and other abdominal surgical conditions are managed appropriately. In this way the hernia became 2nd in the general pattern of intestinal obstruction in this series. Adesunkanmi has reported the changing pattern of intestinal obstruction from hernia, which has been the most frequent cause of small intestinal obstruction in several African countries to one dominated by adhesions (14) which is in contrast to this study.

Sigmoid volvulus ranked 3rd by accounting 14.8%. This is in agreement with other study done in the southern part of the country(7) However, B.Kotiso et al. and other study in northern part of Ethiopia (3,23) found sigmoid volvulus and small bowel adhesion were the leading cause of intestinal obstruction each constituting 27.4%. The number of patients with sigmoid volvulus might have been deceased because cases of sigmoid volvulus which were managed as outpatient by simple rectal tube deflation were excluded.

In this series the intestinal resection rate was 38.4% which is comparable to Ntakiyiruta et al. (1) which was 36.2% but is in contrast to A.N. Osuigwe et al (10) which showed the resection rate of 50%. This could be explained by late presentation. It is well documented in literatures that aggressive resuscitation which includes adequate intravenous fluid infusion and antibiotic exposure as well as prompt surgical intervention is required to reduce this resection rate. Some

authors also emphasize the use of modern imaging technique in arriving at an accurate pre operative diagnosis which leads to early surgical intervention (17).

Fifty nine (27.3%) of patients had post operative complications which is in agreement with the study done in TAH (28%) and Sepsis was the leading cause of post operative complication in this study which accounted for 20.3% of all complications encountered which is consistent with the study of B. Kotiso et al (3) which identified the same complication as with this study. But in Nigeria (10) the comment post operative complication was burst abdomen.

In this study the overall mortality rate was 12% which is almost twice higher than that of a study done in Ruanda which is 6.7% and in Nigeria the mortality rate was 9.2%(1,10). This higher number of mortality in this study could be explained by late presentation. The reason for late presentation to institution delivering the surgical treatment needs to be studied further.

But still the reasons for the delay might be lack of appropriate institution or surgeon to handle acute abdominal situation which in turn might have played a role in the delay. Moreover a sizable number (87.5%) of the patients had come out of Jimma which could also explain the late presentation either due to lack of transport or little awareness about the illness.

STRENGTH AND LIMITATIONS OF THE STUDY

Strength of the study

- As far as many searches there were no other studies done on the same topic in the same area. Therefore, this study can be used as a base line for other studies.

Limitations of the study

- ☞ Difficult to generalize to the country.
- ☞ Shortage of literatures on specific topic to compare the results.
- ☞ Missing patient charts.

CHAPTER SEVEN -CONCLUSION AND RECOMMENDATIONS

7.1 CONCLUSION

- Intestinal obstruction is a commonly encountered condition accounting for large number of the surgical emergency procedures done in the department.
  Several factors contribute to poor out comes in the case of intestinal obstruction. Some of this determinant may include poor health care seeking behavior, ignorance and poverty. The pattern of intestinal obstruction is an indicator of how well surgical services are developed in a certain region. Intestinal obstruction can be caused by many conditions that vary from country to country, from area to area within the same country.

- A total of 216 patients were included in this study. Nearly 3/4th of the patients were males and the male to female ratio was 2.8:1. Their age ranged from 14-73 years and the mean age was 38.3± 3.9 years. The majority of patients residence is out of Jimma town which is 87.5%.
- Only less than half of the patients (44.4%) reached to JUSH with in less than 48 hours.

- In this study small bowel volvulus was the leading cause of intestinal obstruction accounting for more than quarter of all cases of intestinal obstruction (33%) followed by hernias and sigmoid volvulus 15.3% and 14.8% respectively.
- Significant number of patients had post operative complications, sepsis being the leading cause.

- The overall mortality rate of patients in this series was 12% which may be unacceptably high and the leading cause of death was septic shock in 65% of the patients.

7.2 RECOMMENDATIONS

Based on the findings of this study, the following recommendations were given to Different authorities.

- ☞ JUSH should give emphasis to appropriate keeping of patients records for which measures should be taken by the administration of the Hospital.

- ☞ As far as JUSH is a teaching Hospital, the responsible bodies in the Hospital should communicate with Zonal and Woreda health departments which are found within the Hospitals catchment areas and should arrange conditions in upgrading health professional's knowledge and should evaluate their practice on intestinal obstruction.

- ☞ Information Education Communication should focus on addressing the main myths and misconceptions of the communities about intestinal obstruction. This is also essential when it planned and implemented by collaborating different stake holders to increase the public awareness.

- ☞ The regional health bureau, the FMOH and other stake holders should strengthen up their capacities in making health professionals capable of performing emergency surgical procedures. And further efforts should be made in equipping health facilities with necessary materials.

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ANNEX – Data collection format

This check list is designed to collect data about the pattern of intestinal obstruction in adult patients by reviewing patients chart, registration books, operation notes, admission and discharge registrations.

N.B Please fill all the necessary information.

PART- I. IDENTIFICATION

1. Card number _____
2. Age_____
3. Sex
    a. Male
    b. Female
4. Address_____

PART- II. HISTORY OF ILLNESS

5. Chief complain of the patient at presentation

    a. Abdominal pain

    b. Abdominal distention

    c. Constipation

    d. Vomiting

    e. Other, specify if any_____

    _____

6. Duration of onset of symptoms (in hours) _____

7. Physical findings the patient had_____

_____

_____

8. What was the diagnosis? _____

9. What was the intra operative finding? _____

_____

_____

10. What was the type of operation done for the patient? _____

_____

_____

11. How was the post operative period?

a. smooth_____

b. complicated_____ (if complicated go to the next question)

12. What was the complication/s the patient developed?

_____

_____

13. The outcome of the patient

a. Improved c. Not improved

b. Expired d. Unknown

14. If expired, what was the cause of death? _____

_____

15. Total days of Hospital stay? (In days)_____

N.B PLEASE RE CHECK THAT YOU HAVE FILLED ALL THE QUESTIONS