A FIVE YEARS RETROSPECTIVE HOSPITAL BASED STUDY ON PATTERN AND MANAGEMENT OUTCOME OF ACUTE SIGMOID VOLVULUS AT METTU KARL REFERAL HOSPITAL, OROMIA REGION, SOUTH WEST ETHIOPIA

BY:-SEBLE AWLACHEW

THIS IS RESEARCH THESIS SUBMITTED TO JIMMA UNIVERSITY COLLEGE OF PUBLIC HEALTH AND MEDICAL SCIENCES FOR PARTIAL FULFILMENT FOR THE DEGREE OF MASTERS INTEGRATED EMERGENCY OBSTETRICS/GNY AND GENERAL SURGERY.

OCTOBER 2010E.C
JIMMA UNIVERSITY

JIMMA

A FIVE YEARS RETROSPECTIVE HOSPITAL BASED STUDY ON PATTERN AND MANAGEMENT OUTCOME OF ACUTE SIGMOID VOLVULUS AT METTU KARL REFERAL HOSPITAL, OROMIA REGION, SOUTH WEST ETHIOPIA.

BY:-SEBLE AWLACHEW

ADIVISERS: 1.Dr.GERSAM ABERA (GENERAL SURGEON)

2. Mr. DEMEKE KIFLE (MSC)

OCTOBER 2010E.C

JIMMA UNIVERSITY

ABSTRACT

BACKGROUND: Sigmoid volvulus is the commonest cause of large bowel obstruction in many regions of the world. Its prevalence varies greatly geographically. In Ethiopia, the disease is the commonest cause of emergency admissions due to intestinal obstruction. However, few studies have been conducted in North West and central part of the country in general; there was no study in Mettu particularly.

Objective: To assess the pattern & management outcome of acute sigmoid volvulus at MKRH, oromia region, south west Ethiopia.

METHOD: A facility based retrospective cross sectional review of surgical records was obtained. Data was collected with structured questioner by three pre trained data collectors. The collected data were checked for its completeness, entered, edited, cleaned and analyzed using Statistical Package for the Social Sciences (SPSS) version 22.0. For all statistical significance tests the cutoff value set is P<0.05.

Result: one hundred thirty one patients were managed non-operatively &operatively for acute sigmoid volvulus, of which108 (82.4%) were male patients (Male to female ratio of 4.7:1). The Hospital prevalence of acute sigmoid volvulus was 27.9%. Abdominal pain, abdominal distention & inability to pass feces & flatus were invariably the main presenting compliant in 131 (100%) of patients and abdominal distention was the dominant physical finding in 131(100%) of those patients. Those patients who had viable bowel was 97(74%) & gangrenous bowel was 34(26%). Primary resection & anastomosis was done for 78/131(59.5%) and followed by Hartman's colostomy 18/131 (13.7%). The case fatality rate of patients after primary resection & anastomosis 6.4%.Factors associated with poor outcome were female sex (p-.025), primary resection and anastomosis (p-.020) and duration of illness (p-.027). The predominant postoperative complication was wound infection in 13/102(12.7%).

Conclusion & Recommendation

- The Hospital prevalence was 27.9% and mortality rate of acute sigmoid volvulus4.5%.
- The most common management option was primary resection & end to end anastomosis.
- Increasing referral linking and community awareness for early medical seeking behavior.

Key words: Comparison**,** Sigmoid volvulus, outcome

ACKNOWLEDGMENT

I would like to express my deepest gratitude to Jimma University for giving me this education opportunity, MOH facilitating the program and my adviser to Dr.Gersam Abera (General surgeon), Mr. Demeke kifle (MSC) for their indispensable comments and suggestions in the preparation of this proposal and analysis. Last but not least, I would like to acknowledge all staffs of MKRH for helping me during the data collection period.

Contents

List of tables & Graph

List of acronyms

DRE**:** digital rectal examination

GPs**:** General practitioners

HOs**:** Health officers

IESO: integrated emergency general surgery and obstetrics and gynecology

JU**:** Jimma University

IO**:** intestinal obstruction

LBO**:** large bowel obstruction

MKRH**:** Mettu Karle Referral Hospital

OPD**:** Outpatient department

SBO**:** small bowel obstruction

SV**:** Sigmoid volvulus

TAH**:** Tikur Anbessa Hospital

CHAPTER ONE: INTRODUCTION

1.1BACK GROUND INFORMATION

Sigmoid volvulus is one of the frequently occurring surgical diseases known to man since time immemorial. Detailed records of this disease were found in the Egyptian Papyrus Ebers and in Ancient Greek and Roman writings. Insufflations with air to untwist a sigmoid volvulus, a mode of treatment which Hippocrates had advocated, are still the basis for the non-operative approach in the treatment of sigmoid volvulus accepted by surgeons worldwide [1, 2].

Sigmoid volvulus is an abnormal twisting of the bowel on its mesenteric axis greater than 180 degrees, which produces an obstruction of the intestinal lumen and mesenteric vessels [3, 4]. Complete volvulus results in closed loop obstruction and early mesenteric vascular occlusion [5].

It is the commonest cause of large gut obstruction in many regions of the world [6, 7] and extremely common in the so called "volvulus belt" which includes Africa, the Middle East and Brazil. The prevalence of volvulus as a cause of large bowel obstruction varies greatly geographically, from 1-2% in the United States to nearly 80% in the Andes [8, 9].

In Ethiopia, the disease is the commonest cause of emergency admissions due to intestinal obstruction [6].

One important fact in the epidemiology of the disease which still requires satisfactory explanation is the difference that exists among the sexes. While male preponderance is observed in some African, Asian, and Latin American countries, there was no marked variation in the male/female ratio in some western countries such as the United States and Great Britain [10, 11]. Attempts were made to demonstrate the role of genetics with respect to sigmoid volvulus but lacked adequate convincing evidence [12].

However, a large pelvis and soft abdominal musculature in females believed to reduce the prevalence of sigmoid volvulus quite markedly for it provides better mobility to the sigmoid loop. However, this argument fails to explain the reason why there is less significant difference in male/female ratio of sigmoid volvulus prevalence in western societies. Similarly, even though high fiber diet is believed to increase the incidence of sigmoid volvulus in Africa, and Asia it is found to be less frequent in women in countries where men and women share the same diet. It is more common among old males and very rare in children [13].

The etiology of sigmoid Volvulus is unclear but high altitude, along with other etiologic factors, may play an important role in its etiology. Other etiological factors of sigmoid volvulus include anatomic variation, chronic constipation, neurological disease, and mega colon [4].

A patient gives history of colicky abdominal pain with distension which is relieved by passage of flatus and loose stool. In the acute stage pain, constipation and abdominal distension are the commonest clinical features. In gangrenous cases; blood may be seen in the rectum on digital examination. Diagnosis is made on clinical and radiological findings. [11,14].If diagnosis is still in doubt and gangrene not suspected, water soluble contrast enema usually shows a birds beak deformity at the sight of torsion, sometimes this maneuver can be therapeutic also.[15].

Plain X-ray abdomen shows a massively dilated large bowel loop arising from the pelvis and extending obliquely across the spine to the upper abdomen, in a tyre-like appearance also referred to as the sigma sign [7].

Even though, the management of sigmoid colon volvulus remains controversial [5].There is little debate that gangrenous sigmoid volvulus must be resected. In the majority of centers, resection is followed by Hartmann's procedure. Others advocate primary anastomosis in the absence of absolute contraindications such as shock, local purulent infection, fecal contamination, perforation of necrotic bowel [7].

However the final decision depends on the surgeon’s experience and attitude. There is also unanimity that in cases of acute sigmoid volvulus with viable bowel, the best option is preoperative rectal deflation and when successful, conversion from emergency to elective laparotomy, with resection and primary anastomosis [14].

Non-operative reduction alone and non-resection operative procedures, such as sigmoiopexy and mesosigmoidoplasty have lower morbidity and mortality rates but haves high recurrence rate [1].

1.2. Statement of the problem

Acute sigmoid volvulus is one of the commonest causes of large bowel obstruction. Its incidence varies considerably from one geographic area to another [1].But there is no satisfactory explanation for the geographical distribution [9].

The management of sigmoid volvulus is often challenging because of its prevalence in high-risk patients and the associated per operative morbidity and mortality rates, there were many approaches recommended by different researchers [16].

Volvulus of the sigmoid colon is the commonest cause of large bowel obstruction in Africa. The highest incidence is reported from Ethiopia where it accounts for 56% of patients with intestinal obstruction [6,14].According to few reports from northwest and central part of Ethiopia ,56% in Gonder and 36.1% in Tikur Anbessa Hospital ,Sigmoid volvulus is the leading cause of intestinal obstruction [6, 22]. But to my knowledge there was no report from Mettu, even from the region. So, the purpose of this study is to provide information on the pattern and the management outcome of sigmoid volvulus in Mettu Karl referral Hospital, Oromia region, south west Ethiopia.

1.3. SIGNIFICANCE OF THE STUDY

The result of the study was provide recent information on sigmoid volvulus for the country especially to the study area and used to increase the patient quality care. There are controversies regarding the disease management options so, this study was provide the experience of Mettu Karl referral Hospital and increase the knowledge about the disease. It can be also used in teaching learning purposes in medical schools. Additionally, it was used as a baseline for further studies.

CHAPTER TWO:

2.1 LITERATURE REVIEW

Sigmoid volvulus is one of the commonest causes of large bowel obstruction in many regions of the world [7].Nowadays its incidence has considerably decreased and sigmoid volvulus is a rare event. Particularly in North America and Europe it represents 3.7-6% of all intestinal occlusions and it usually occurs in elderly patients with a greater incidence in the 8th decade. Conversely in other countries this pathology still shows a higher incidence: 24% in East India, 40% in North India, 32% in Iran, 31% in Zimbabwe, 54% in Ethiopia, 33% in Sudan [17].

In the same way a recent study done in Minnesota, U.S.A revealed that, from One hundred three cases of volvulus (50 sigmoid, 53 cecal) were identified in 92 patients. When Compared with cecal volvulus, sigmoid volvulus was more common in men, patients with neurologic diagnoses, and residents of skilled nursing home [18].

As in other neighboring countries, the rate of colon volvulus causing intestinal obstruction is high in Turkey and it was 19.1%. Chronic constipation, congenital abnormalities, age, drug addiction, neuro psychiatric disorders, and surgery play a role in the etiology of colonic volvulus, and the main predisposing factor for this condition is a high-fiber diet. Although a preponderance of males among sigmoid volvulus patients have been reported, the male: female ratio in previous reports was interestingly different. In this report, a 3.2-fold incidence was seen in males. Sigmoid colon volvulus is usually a disease of the aged. [19].

In other similar study done, there were 75.3% men and 24.6% women with a mean age of 65 years (range 21-85 years), men being slightly younger than women (58 years *versus* 65 Years).Seventy-one percent of patients were 50 years or older and 38 percent were over 70 years of age [3].

A retrospective study done in King Abdullah University Hospital, Faculty of Medicine, Jordan sigmoid volvulus was responsible for 9.2% of all cases of large bowel obstruction seen during the study period. There were 32 patients with sigmoid volvulus, 75% of whom were men. The median age of the patients was 59 years (range 21-83 years) [20].

Another study done in West African population, showed that from a total of 48 patients, 93.8% males and 6.3%females, with a male: female ratio of 14.3:1, age range of 19 to 78 years and mean age of 45.8 +/-17.6 years underwent treatment for acute sigmoid volvulus [1].

In the same way, a study done in Uganda also showed that, patient's ages ranged from 16 to 80 years, with a mean of 52.2. The peak age was 51-60 years for males and 41-50 for females. The frequency of sigmoid volvulus rose with the increasing age and this was more so for the males. Males accounted for 84% of cases; the male to female ratio sex ratio was 5.3:1. The mean age for males was 54.4years compared with 40.4years for females [13].

According to the study done in Moi teaching and referral Hospital in western Kenya, Sigmoid volvulus accounts for 14.1% of all cases of intestinal obstruction and 80.0% of large bowel obstruction [9].

A retrospective study done in Asmara national Hospital revealed that, sigmoid volvulus is high132(37.6%) in the list among the major causes of intestinal obstructions treated with male 98.5% and1.5% female [21].

Another study from Sudan also showed that, 18 males and four females were involved in the study. The age ranged from 30–80 years with the mean age 59.7 year. All patients were from rural areas and at laparatomy the bowel was viable 16(72.7%) and in 6(27.3%) patient's bowel was gangrenous emergency resection and anastomosis were done and one patient (4.5%) out of this group died shortly in the post operative period. [2].

A study done in Central Ethiopia Attat Hospital to discuss the management of sigmoid volvulus both with viable and gangrenous bowel revealed that, from a total of 79 patients 70 were male and 9 were female with male female ratio of 7.8:1 and mean age of 53years. Among79 patient managed with sigmoid volvulus, 25(32%) of the patients had gangrenous bowel while 54(68%) had viable sigmoid colon. Seventy three of the patients were managed by resection and primary anastomosis 23(31.5%) were gangrenous bowel and 50(68.5%) were viable bowel. Two (9%) of the 23 patients with gangrenous bowel who had resection and primary anastomosis died while for those with viable sigmoid colon the mortality rate was 4 %(2 out of 50).So, it is recommended that whenever possible, resection and primary anastomosis should be the procedure of choice in the management of sigmoid volvulus [22].

A qualitative anthropological study in Gondar region, northwestern Ethiopia, revealed a very striking difference in cultural patterns of defecation in the two sexes which coincided with a high male/female ratio (16.5:1) of sigmoid volvulus morbidity in the regional Hospital. Adult males show very irregular bowel behavior, with bowel motions varying from zero to four per day. Irregular bowel behavior in males, combined with the population's consumption of high fiber diets producing flatus and bulky stools, appears to overload the sigmoid colon, which elongates and dilates gradually, and subsequently undergoes volvulus occasionally [11].

A retrospective analysis study done in two teaching Hospitals of Addis Ababa University ,Tikur Anbessa and the Saint Paul's Hospital revealed that, the most frequent disease conditions that necessitated the formation of colostomy were gangrenous sigmoid volvulus 56 (36.1%), Colonic cancer in 29% and Colonic trauma in 20%ofthe patients [23]

A retrospective study of 145 patients with sigmoid volvulus seen over a three year period in Gondar north, west Ethiopia revealed that, Sigmoid volvulus was the commonest cause of emergency admissions with intestinal obstruction (56%). The mean age was 55 +/- 13 years, (range 10-80), and the male to female ratio was 13.5:1. The presence or absence of a previous attack makes a significant difference in the occurrence of gangrenous bowel. Eighteen out of 75 patients (24%) with no previous attack had gangrenous bowel compared with 2 out of 57 (4%) after recurrence. A conservative sigmoidoscopic detorsion was successful in the majority of the cases (63%). Elective surgery after bowel preparation was associated with a mortality rate of 3% in comparison to 12.5% mortality rate in patients with viable bowel operated on an emergency basis ($p < 0.05$). Sigmoidoscopic detorsion should be the first measure in patients with viable bowel.

The duration of symptoms ranged from 20 hours to 8 days (average 1.7 days). Patients under 50 years presented earlier (average 1.1 days). All patients complained of abdominal pain and inability to discharge gas or stools. Other complaints reported included constipation 39.5%, nausea 27.1%, vomiting 20.9% and diarrhea 9.8%.on physical examination, the most consistent finding was abdominal distension 95.0%. Localized tenderness was present in 41.9% patients, and there was generalized tenderness in 13%. Fever and leucocytosis were present in 95.0% patients in the absence of another source of infection. The rectum was empty on digital examination in 93.8% [6].

According to a study done to analyze the findings on abdominal radiography; a dilated sigmoid colon that ascends cephaladal to transverse colon is newly described accurate finding of sigmoid volvulus [24].

The best treatment for sigmoid volvulus consists to an endoscopic volvulus removal intervention followed by a sigmoidal resection during the same Hospitalization period. Urgent laparotomy is indicated in case of signs of necrosis or failure of endoscopy. Sigmoidal resection without immediate restoration of digestive continuity is recommended in presence of risk factors of anastomotic loosening [25].

In study done to evaluate the role of emergency laparotomy in patients presenting with acute sigmoid volvulus at El Obeid Teaching Hospital, Western Sudan, in laparotomy the bowel was found viable in 72.7% patients where untwisting, deflation and fixation was performed. Patients reported later for elective resection. Three patients were re-admitted with recurrence before their Scheduled elective surgery and were then offered immediate resection and anastomosis. Eight patients were lost at follow up. In 27.3% patients the bowel was gangrenous. Emergency resection and anastomosis was done. A 4.5% out of this group died shortly in the post-operative Period [2].

A total of 44 cases were studied, among those cases who presented as emergency, with acute sigmoid volvulus at St. Mary's Hospital Lacor in Gulu, Uganda,27(61.3%) had acute sigmiod volvulus among these patients 20(74%) managed with primary resection and anastomosis, colostomy 5(18.5%) and sigmiodoscopy 2(7.4%).Amongst the patients treated with primary resection and anastomosis, 2(10%)died while 1(20%) of those who had colostomy died, however this difference was not significant. Therefore primary resection and anastomosis in sigmoid volvulus did not adversely affect outcome of treatment [13].

As long term surgical outcome follow up study done in Turkey, completed for 63 patients (37 primary resection and anastomosis, 26 Hartmann's procedure). Restoration of bowel continuity was successfully performed in 25 of 26 Hartmann's procedure patients. Constipation was reported by 83% of primary resection and anastomosis and 65% of Hartmann's procedure patients. Of these patients, 51% regularly used laxatives. No patient complained of incontinence, and no recurrences of sigmoid volvulus were recorded during the follow-up period. Sigmoidectomy with primary anastomosis is a good option for the definitive management of

sigmoid volvulus. Despite the high constipation rate, no recurrence occurred during long-term follow-up [12].

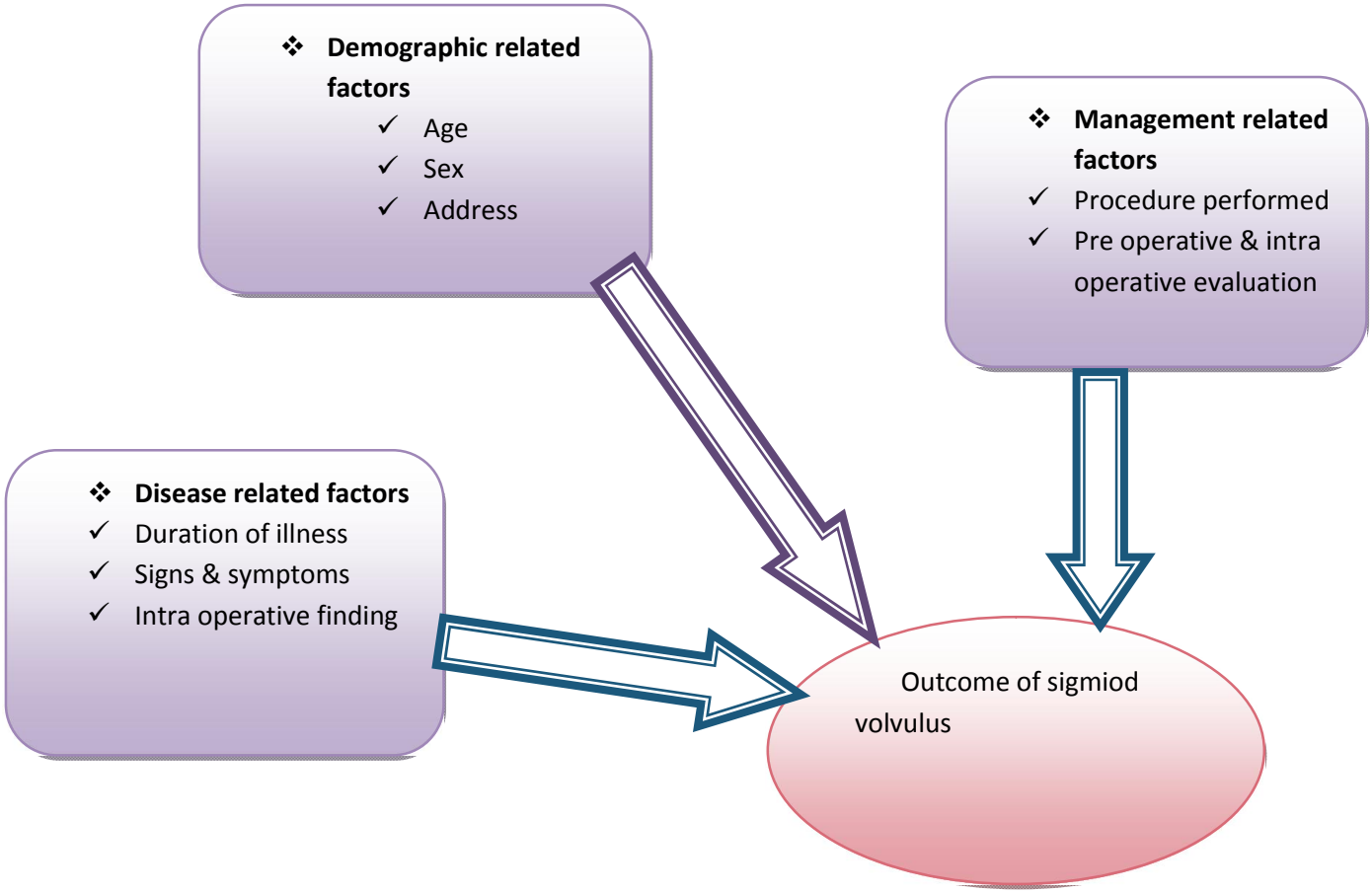
A study done in Pakistan also indicates that, resection of the redundant sigmoid colon with end to end anastomosis was performed without colostomy in all cases, which was contrary to the classical conservative approach advocated before. Regarding postoperative complications four 18.2% patients had wound infection which was treated conservatively, while 9.1% patients developed pelvic abscess which were drained through rectum under ultrasound guidance. A 4.5% patient died in this series. The hospital stay ranged from 9-24 days, with a mean stays of 12days [7].

On the contrary to the above, a study from University of South Africa, Polokwane Campus, Limpopo revealed that, of the 54 patients with viable bowel, 39 had resection and primary anastomosis, with a mortality rate of 3% (1:39, 38%) and morbidity of 18% (7:39); 8 cases underwent Hartmann's procedure, with 0% mortality but a higher morbidity (3:8). Operative derotation and simple sigmoiopex was done in 7 cases. Strongly believe that in patients with gangrenous bowel, resection without immediate restoration of bowel continuity has the lowest possible achievable mortality. None of the other known procedures could achieve as low a mortality rate as Hartmann's procedure in these particular cases [14].

Initial therapy with endoscopy affords decompression and an adequate preparation of patients for surgical resection, and a flexible colonoscopy has notable advantages over rigid instruments for the detortion process [3].

The mortality of patients affected by sigmoid volvulus is related to the disease stage, prompt surgical timing, functional status of the patient and his collaboration with the clinicians in the pre-operative decision making process. Mortality is higher in both obstructed patients with generalized peritonitis and patients affected by sub occlusion with late diagnosis and surgical treatment; in both scenarios a Hartmann's procedure is the proper operation to be considered [17].Acute sigmoid volvulus is a surgical emergency, although the majority 75% can be successfully decompressed non operatively. Emergency surgery in these patients is associated with a mortality of 17.6% in our series. Elective definitive surgery is suggested in view of the high recurrence rate greater than 60% and the considerable risks of emergency [16].

Despite the controversy, usually the aim of treatment is to relieve the obstruction and compress the twisted sigmoid colon. Many authorities now agree that, in uncomplicated sigmoid volvulus (perforation or gangrene) sigmoid resection with immediate primary anastomosis is a first choice single-stage operation as it does not increase morbidity or mortality rates. Although sigmoid volvulus is also frequently successfully treated by endoscopic decompression, the principal therapy of this condition is surgery. Nevertheless, patients with advanced age and multiple co-morbidities might deteriorate on surgical repair [13].



Conceptual frame work

CHAPTER THREE:

OBJECTIVES OF THE STUDY

3.1 General objective

- To assess the pattern & management outcome of acute sigmoid volvulus at Mettu Karl referral Hospital from September 1/2005 to August 30/2009EC.

3.2. Specific objectives

1. To determine the prevalence of sigmoid volvulus at MKRH.
2. To assess clinical presentation of sigmoid volvulus at MKRH.
3. To assess the management options of sigmoid volvulus at MKRH.
4. To determine factors affecting management outcome of sigmoid volvulus at MKRH.

CHAPTER FOUR: METHODOLOGY

4.1. Study Area & period

The study was conducted at MKRH in Mettu town, oromia zone which is found in Oromia region, south west Ethiopia, 595kilometers from Addis Ababa .The zone has 39 health centers that are government owned &run by the government /Mettu town health administration office/.

The total population of the Mettu zone is 1.6million at which 828,877 are males &737,757 are females. MKRH was established by Swedish missionaries and Ras Tefer in1932EC and it is the only referral Hospital in the zone that serves for many peoples. It has 216 beds, out of this 65are found in surgical ward; some of the services that are given by this department are in patient service, emergency, elective minor & major surgical operation & blood transfusion

The total number of staff in the Hospital is 316 out of these 170 of them is health professionals including 5 specialist, 16 GPs, 1 HO, 78 nurses, 6 Anesthetics, 3 laboratory technical, 9 laboratory technologists,1 dental surgeon,17 Midwife, 2 radiography, 3 druggists and 8 pharmacists. The number of health professionals in surgical ward is two surgeons, one IESO, 2 BSC nurse and 11 clinical nurses.

The study was conducted from January to Augest30/ 2009 E.C on cases managed between September1/2005- August30/2009 E.C

4.2. Study design-Facility based cross-sectional study on the records in all patients who had acute sigmoid volvulus at MKRH in the study period was conducted**.**

4.3. Population

4.3.1 Source population

All patients admitted to surgical ward of Mettu Karl referral Hospital with the assessment of bowel obstruction.

4.3.2. Study population

All patients' charts managed with acute sigmoid volvulus at Mettu Karl referral Hospital from September1/2005-Augu30/2009EC.

4.4. Sample size & sampling techniques

4.4.1 Sample size

All patient' charts were reviewed for acute sigmoid volvulus during the study period from September1/ 2005 to August30/ 2009EC.

4.4.2. Sampling techniques

All large bowel obstruction managed for acute sigmoid volvulus was included. First, operative records from surgical ward, OPD register and major operation registry book in the operation room was reviewed to identify patient who managed for sigmoid volvulus from September 1, 2005 through to August 30, 2009E.C. Next, using card no. of patients, cards was collected from the card room. Finally, based on the inclusion and exclusion criteria of the study, cards were selected

4.4.3. Inclusion and exclusion criteria

The patient charts managed for sigmoid volvulus was included in the study.

Patient charts with incomplete data (information) or patients whose cards were lost excluded from the study.

Elective redundant sigmoid resection was excluded from the study; twenty one cases were excluded by exclusion criteria from the study.

4.5. Study variables

4.5.1. Independent variables

Age, sex, address, Religion, occupation, , duration of illness before arrival, signs and symptoms, Type of procedures, Type of indication, intra operative finding, duration of operation ,duration of hospital stay, postoperative complication.

4.5.2. Dependent variable

- Outcome of management

4.6 Data collection process

4.6.1 Data collection instruments and pre test

Data collection tools were adopted from similar studies. Those tools include a special patient Performa that includes socio-demographic characteristics, signs and symptoms, physical findings, procedure done, indication, operative finding, outcomes, complications encountered, and other relevant items related to disease. The structured checklist was documented from each patient card and surgery registration books. The check lists were prepared in English language.

Before the actual data collection, the questionnaire was tested on5% of the total study population then possible modification was on the check list using the finding pre test.

4.6.2 Data collection procedures

The data was collected by IEOS student who were clinical attachment in MKRH. Training was given for data collectors regarding the purpose of the study and the procedures to be followed for data collection and the principal investigator was supervised them. The data collection was held from January - August 30/2009E.C at MKRH.

4.7 Data processing and analysis

The collected data was coded, cleaned and entered into SPSS version22.0 for analysis. Then, the data was presented using tables, percentages, graphs and mean values for descriptive analysis. The association between each dependent and independent variables were determined by binary logistic regression first, then for those have association (p-value <0.05) was entered in to multiple regression and statically significant variables were used at 95% CI.

Analysis –Regression binary logistic crude association using binary logistic under the binary logistic regression transfer the dependent variable to dependent and the predictor or only one predictor variable to the covariates. If the predictor variable is categorical click the categorical and by highlighting the variable transfer to categorical covariate by choosing &ticking the reference option(first or last) and clicking change click the continue. Then click the option and mark the CI for B (Exp) 95%.

Adjusted association with logistic regression –Analysis regression binary logistic it is the most commonly used to adjust for explanatory variable adjusting for about 10 to 15 variables depending on sample size. The same procedure as in analyzing crude analysis using binary logistic regression transfer to dependant variable to dependant & the predictor variable or all usually less than 10-15 possible predictor variable to the covariates. The predictor variable can be transferred step by step thus you are able to see individual and interaction effect step by step.

6. 8. Data quality assurance

Data collectors were trained for a couple of three days prior to collection. The training was given on the objectives of the study, how to retrieval a sigmoid volvulus cases from clinical records, keeping the confidentiality of the patients and how to fill the checklists and completeness of the data. The checklist was developed from previous literatures [9, 14, 15, and 21] and adopted according to the local context. The quality of the data collected was assured by checking all checklists at the evening of the date of collection by principal investigator.

4.9 Ethical clearance

The ethical issue of this study was approved by the ethical committee of the Jimma University, Collage of Public Health, Medical Sciences, MKRH & official permission to undertake the study was obtained from the MKRH. The supportive staffs (i.e. Card room workers and surgical staffs) were informed about the purpose of the study and verbal consent was obtained. Privacy & confidentiality was maintained during data collection period.

4.10 Operational definitions

Sigmoid volvulus: It is twist of redundant sigmoid on its base in anti-clock wise direction.

Colostomy: is an artificially created communication between colon and abdominal wall.

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

Procedure done: the main procedure done after laparatomy to relieve the obstruction.

Length of hospital stay: the duration of time from admission to discharge or death of the patient classified as prolonged if it is more than 7 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.

Laparatomy: is a surgical procedure involving an incision through the abdominal wall to gain access in to the abdominal cavity.

Good outcome: patients with a clinical diagnosis of sigmoid volvulus who had operatively managed improved, cured &discharged from Hospital & developed no post operative complication.

Poor outcome: Patients with a clinical diagnosis of sigmoid volvulus, who had operatively managed, developed one or more post operative complication or who have died in the intra or post operative period

Rural: patients came out side of Mettu town for cases used from MKRH.

Urban: patients came from Mettu town for cases from MKRH.

Pattern of sigmoid volvulus

- Clinical presentation, both symptom and sign of sigmoid volvulus
- Choice of management option; primary resection and anastomosis ,Hartman's colostomy ,rectal tube deflation and derotation and deflation
- The prevalence of sigmiod volvulus

4.11 plan for utilization and dissemination of result

The result of the study will be presented to Jimma University community as part of IEOS thesis; and it will be disseminated to Jimma University College of Public Health and Medical Sciences, department of, Regional health bureau, zone and district health offices, to the targeted health facility and to NGOs working on this area. Moreover, efforts was done to publish the findings of the study and disseminated through different journals and scientific publications.

CHAPTER FIVE: RESULT

5. DESCRIPTIVE STASTICS

5.1 Demographic characteristics Pattern

Between, September 1/2005 to August 30/2009EC at Mettu Karle referral Hospital a total of 469 patients with intestinal obstruction were registered, out of this 208 patients of them had large bowel obstruction & 261patients had small bowel obstruction, 152 sigmiod volvulus case were registered, only one hundred thirty one patients were evaluated with sigmoid volvulus in this study. Twenty one cases were excluded by exclusion criteria because of missed cards and incomplete data. Card retrieval rate of the study was 86.2%.

The Hospital prevalence of sigmoid volvulus was 27.9% and the mortality rate of acute sigmoid volvulus 4.5%.

Majority of them were male patient108 (82.4%) and 23(17.6%) were females. The mean age was 57.2 yrs (range25-88 yrs and giving male to female ratio was4.7:1. Fifty six (42.7%) of them were Muslim religion followers, while fifty one (38.9%) were orthodox religion followers, 24 (18.3%) of patients were protestant religion followers. Ninety four (71.8%) were from rural areas & the rest 37 (28.2%) were from urban. Sixty seven (51.1%) of them were farmer, 30(22.9%) were merchant, 23 (17.6%) were government employee, while the remaining11 (8.4%) were others. There was no patients in 10-19yrs of age, 6(4.6%) patients were in 20-29 yrs , 12(9.2%) patients were in 30-39yrs , 24(18.3%)patients were in 40-49 yrs , 34(26%) were in50-

59yrs and the rest of them 55(42%) were included in the age group of 60 ≥yrs.

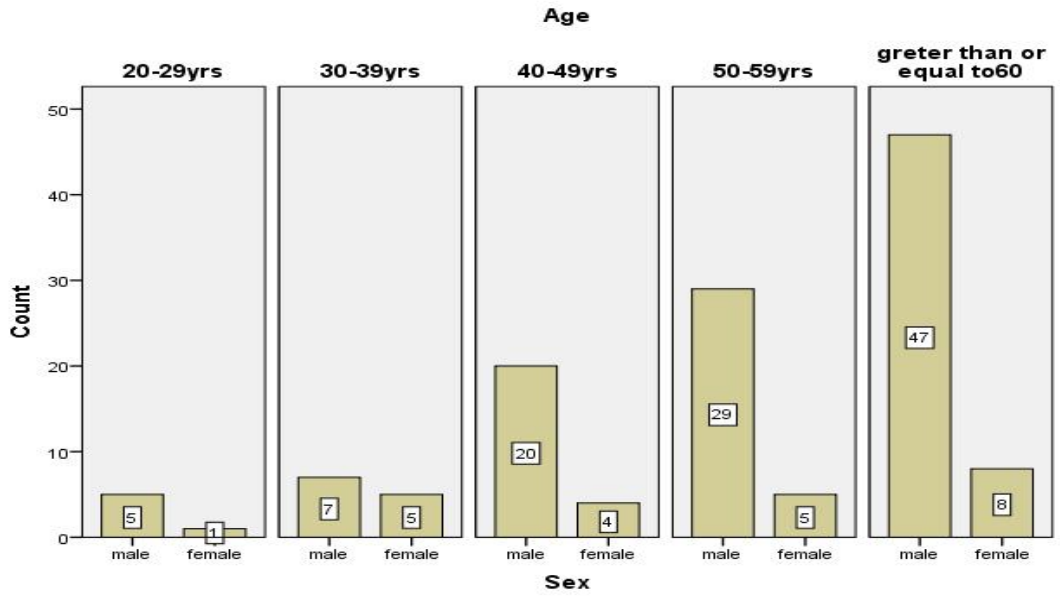


Figure 1: Age and sex distribution of patients for acute sigmoid volvulus at MKRH from september1/ 2005 to Auguste30/ 2009 E.C.

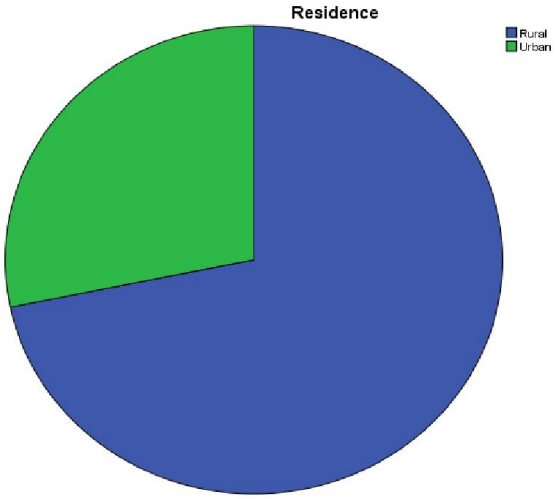


Figure 2: Address of patients managed with non operative & operative for acute sigmoid volvulus at MKRH from September1/ 2005 toAugust30/ 2009E.C

Duration of illness at presentation

Seventy one (54.2%) of patients was arrived at the Hospital after 24 hours of the onset of illness and the rest were come within 24hrs of illness. Majority of them 94 (71.8%) were from rural areas where as the rest 37 (28.2%) were from urban areas.

Table1: durations of illness by address, sex and outcome of patients for acute sigmoid volvulus at MKRH from September 1/2005 to August30/2009(N=131)

Duration of illness	Total	Adders and sex of patients				Outcome & sex			
		Male		Female		Male		Female	
		Urban	Rural	Urban	Rural	Good	Poor	Good	Poor
≤24 hrs	60 (46%)	25 (42%)	31 (51%)	1 (2%)	3 (5%)	50 (83%)	5 (8%)	4 (7%)	1 (2%)
>24hrs	71 (54%)	9 (13%)	43 (60%)	2 (3%)	17 (24%)	39 (55%)	14 (19%)	9 (13%)	9 (13%)
Total	131	34	74	3	20	89	19	13	10

Clinical Symptom:

All patients (100%) had colicky abdominal pain, abdominal distention, and inability to pass feces & flatus were invariably the main presenting complaint of patients. Vomiting & constipation were noticed in 26 (19.8%) & 44(33.5%) of patients respectively. An initial supra pubic pain which latter diffuse the whole abdomen was observed in 131 (100%) of patients.

Clinical Presentation:

Abdominal distention was the major findings in all patients (100%). Twenty nine (22.1%) of them had abdominal tenderness, 91(69.4%) patients presented with empty rectum, 13(9.9%) had

blood on exam finger during digital rectal examination & 21 (16%) patients were presented with vital sign derangement.

Investigation: Total WBC count was determined for 43 (32.8%) patients out of which a raised WBC count (>10,000 cells/mm3) was noted in 17(12.9%) and 82(62.5%) had plain abdominal x-ray.

Table 2: Clinical findings of patients managed for acute sigmoid volvulus at MKRH from September1/ 2005 to August30/2009(N=131)

Clinical presentation	Frequency	%
Abdominal pain	131	100
Abdominal distention	131	100
Inability to pass faces & flatus	131	100
Vomiting	26	19.8
Constipation	44	33.5
Clinical sign		
Abdominal distention	131	100
Rectal empty	91	69.4
Abdominal tenderness	29	22.1
DRE Blood on examining finger	13	9.9
Vital sign derangement	21	16

Management profile

Management of sigmoid volvulus

A total of 131 patients managed with acute sigmoid volvulus out of this102 (77.9%) patients were managed operatively and the rest 29(22.1%) patients initially managed non- operatively latter on elective redundant sigmoid resection was done. Among those patients managed operatively as an emergency were 102(77.9%), 68(66.7%) had viable bowel and the rest 34(33.3%) had gangrenous bowel.

Seventy eight/102 (76.5%) patients had undergone primary resection &end- to end anastomosis, of which 62/78 (79.5%) had viable bowel and 16/78 (20.5%) of patients had gangrenous bowel and the outcome of viable bowel47/62 (75.8%) had good and 15/62 (24.2%) had poor outcome, those who had had gangrenous bowel were16/78 (20.5%) among those patients 7/16(43.8%) had poor and 9(56.2%) patients had good outcome.

The mortality rate after primary resection and end to end anastomosis were 5/78(6.4%), male 4 (80%) and female 1(20%) and this was observed 3 from gangrenous and 2 from viable bowel. Out of this three patients were complicated by anastomotic leakage and two patients were complicated by wound dehiscence.

Eighteen/102(17.6%) patients had undergone Hartman's colostomy and their outcome were12/18 (66.7%) had good and 6 (33.3%) patients had poor outcome.

Six/102 (5.9%) derotation & deflation was done and their outcomes were5 (83.3%) had good and 1(16.7%) patients had poor outcome.

Twenty nine (22.1%) patients managed non-operatively or rectal tube deflation for an indication of acute sigmoid volvulus.

Ninety eight out of 131 patients (75%) with no previous attack, 20/98(20%) patients had gangrenous bowel and 78/98(80%) patients had viable bowel. Thirty three/131(25%) patients had recurrence, four out of 33/131(12%) patients after recurrence had gangrenous bowel and the rest 29/33(88%) patients had viable bowel, out of 33(12%) previous attak patients 8(24%) had poor out come.

Table3. Shows procedure & out come for operative management and intra operative finding of acute sigmoid volvulus cases MKRH, Oromia region, south west Ethiopia September1/2005 to August30/2009EC.

Procedure & out come with viable bowel				
	No of Patient	Death	**Good**	**Poor**
Derotation & deflation	6(5.9%)	1	5(83.3%)	1(16.7%)
Resection & anastomosis	62(60.8%)	2	47(75.8%)	15(24.2%)
Procedure & outcome with gangrenous bowel				
	No of patient	**Death**	**Good**	**Poor**
Resection colostomy	18(17.6%)	0	12(66.6%0	6(33.3%)
Resection & anastomosis	16(15.7%)	3	9(56.2%)	7(43.8%)

Table-4: Operative procedures & non operative management performed for acute sigmoid volvulus at MKRH from September1/ 2005-August30/2009EC.

Type of procedure	**Frequency**	**%**
Resection& end to end anastomosis	78	59.5
Hartman's colostomy	18	13.7
Derotation& deflation	6	4.7
Rectal tube deflation	29	22.1
Total	131	100

Management Outcome of sigmoid volvulus

Postoperative Complication:

Seventy three/102(72%) of the patients had good outcome where they have improved and discharged from the Hospital and developed no postoperative complication, but29/102 (28%) of them had poor outcome where they have improved but developed one or more postoperative complication or death.

The commonest post operative complication was wound infection 13/102(12.7%) followed by wound dehiscence 6(5.9%), anastomosis leakage4 (3.7%), post operative intra abdominal abscess

2(1.9%) and 4(3.6%) of the patient were developed other complication. There were six total deaths; of them five were male &one was female patients. The mortality rate was 4.5%. For 12 patients re-laparotomy was performed. The commonest indication for re-laparatomy was wound dehiscence 6 (50%) anastomosis leakage 4(33.3%) &intra abdominal abscess2 (6.7%).

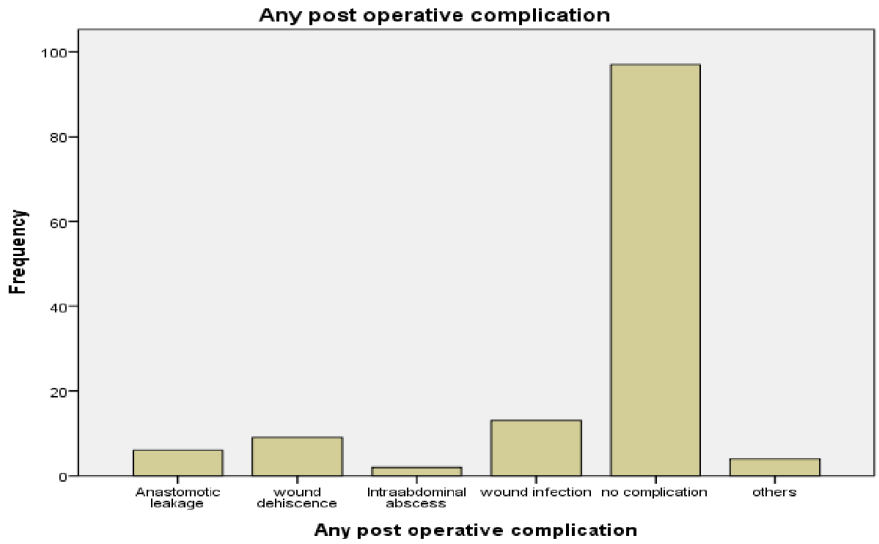


Figure-3: Postoperative complications found in patients operated for acute sigmoid volvulus at MKRH from September1/2005-August30/ 2009EC.

Length of Hospital Stay:

The length of Hospital stay of the patients ranged from 3 to 38 days having an average length of stay of 13.5 days.

Table 5:shows the duration of hospital stay in SV cases MKRH, south west Ethiopia

Duration of Hospital stay	Frequency	%
≤ 7 day	42	32.1
>7days	89	67.9
Total	131	100

Factors affecting Management Outcome of sigmoid volvulus

Measures of association were performed to test the association between each independent variable with the dependent variable, management outcome of acute sigmoid volvulus.To identify the factors associated with management outcome of acute sigmoid volvulus by a binary logistic regression was performed on a dichotomous dependent variable. Therefore; variables with P-value of <0.05 like sex, residence, religion, duration of illness before arrival to Hospital, type of procedure, intra-operative finding ,indication, intra operation duration were selected as candidates and entered final model.

Management out come and associated factors

Table 6. Measures of association between factors and outcome of patients for acute sigmoid volvulus at MKRH from September1/2005 to August30/ 2009EC.

Variable	Outcome		COR(95%CI)	P=value	AOR(95%CI) Exe(B)	P=value
	Good N=102	Poor N=29				
Sex						
Male	89(82.4%)	19(17.6%)	1		1	
Female	13(56.5%)	10(43.5%)	3.6(1.78,9.427)	.009**	3.968(1.190,13.22)	.025**
Residence						
Rural	70(74.5%)	24(25.5%)	2.194(.767,6.33)	.143	1.078(.32,3.634)	.904
Urban	32(86.5%)	5(13.5%)	1		1	
Duration of illness before arrival						
≤24hrs	54(90%)	6(10%)	1		1	
>24hrs	48(67.6%)	23(32.4%)	4.314(1.62,11.479)	.003**	3.469(1.154,10.4)	.027**
Gangrenous bowel						
Yes	21(61.8%)	13(38.2%)	3.134(1.3,7.519)	.011**	1.29(.282,5.887)	.744
No	81(83.5%)	16(16.5%)	1		1	
Resection & end to end primary anastomosis						
Yes	56(71.8%	22(28.2%)	2.58(1.0,6.58)	.047**	3.92(.242,12.40)	.020*

No	46(86.8%)	7(13.2%)	1			
Sign of peritonitis						
Yes	22(61.1%)	14(38.9%)	3.394(1.425,8.0)	.006**	3.128(.697,14.03)	.136
No	78(82.1%)	17(17.9%)	1		1	
Duration of operation						
≤90min	69(81.2%)	16(18.8%)	1			
>90min	28(60.9%)	18(39.1%)	2.454(1.058,5.694)	.037**	2.81(.814,5.837)	.121

Factors associated with poor outcome of sigmoid volvulus

Binary logistic analysis was done to show the association between management outcome of acute sigmoid volvulus and independent variables p-value of <0.05 was taken to multiples logistic regression to determine its association as shown in the above **Table 6** (sex, duration of illness and primary resection and anastomosis) at p-value <0.05 significant associations.

- ✓ Those patients who came after twenty four hours had three times poor outcome compared to those patients who came before twenty four hours. (AOR=3.47(1.2,10.4),p=0.027**)
- ✓ Those female patients who had sigmiod volvulus were three times poor outcome compared to those male patients who had sigmoid volvulus. (AOR=3.97(1.19,12.2),p=.025**)
- ✓ Those patients who had undergoing primary resection and anastomosis had three times poor outcome compared to those patients who had not done primary resection and anastomosis.(AOR=3.92 (.242,12.4,)p=.020**)

CHAPTER SIX

Discussion

Sigmoid volvulus is one of the commonest causes of large bowel obstruction in many regions of the world [7].

In this study sigmoid volvulus accounts 27.9% from intestinal obstruction and 62.9% from large bowel obstruction. The finding was lower than the study conducted at Gondar 56% and higher than from Moi teaching & referral Hospital in Western Kenya 14.1%, king Abdullah university Hospital in Jordan 9.3% and lower than the study conducted at Asmara Hospital 37.6% [6, 9, 20, 21].In this study the mortality rate was 4.5% it was similar to Sudan (4.5%) and Pakistan 4.5% [2,7].

This study showed that 82.4% patients were male &17.6% were female, with a male to female ratio of 4.7:1and its range was 25-88year with mean age of 57.2. The finding were lowest compared to similar study done in west African population 93.8% were male & 6.3% were females, with a male to female ratio 14.3:1,age range of 19-78yrs mean age45.8±17.6,in Gonder mean age 55±13,age range 10-80years and male to female ratio of 13.5:1 and in Uganda mean of 52.2,age range16-80years and male to female ratio 5.3:1,male accounts for 84%.[1,6,13] .In this study elderly patients was greater incidence in the 6th decade of life it was lower than study conducted in North America and Europe in the 8th decade of life [17]. In this study a 4.7 fold incidence was seen in male but in Turkey it was 3.2 fold [19].

Majority of them (71.8%) of patients came from rural areas, but study done in Sudan showed all patients came from rural areas [2].Duration of illness before arrival has significant statistical association with management outcome, patients who presented within 24hrs duration of illness are less likely to develop poor outcome compared with patients who presented after 24hrs. In this study 54% patients come after 24hrs it is lower study conducted in Gondar indicated an average (1.7 days) all patients came after 24hrs [6].Delayed presentation frequently results in poor surgical outcome and/ or long Hospital stay. In this study the duration of illness ranges from 6 hours to 5 days it is lower compared to other study done in Gondar ranges from 20hrs to 8days [6].

The common presenting feature of acute sigmoid volvulus patients in this study had colicky abdominal pain, abdominal distention, inability to pass feces &flatus each accounts (100%), constipation44 (33.5%), and vomiting occurs 26(19.8%).

On physical examination, the most consistent finding had abdominal distension 100%. Abdominal tenderness was present in 29(22.1%) of patients. leucocytosis were present in 12.9% of patients in the absence of another source of infection. The rectum was empty on digital examination (69.4%). A study done in Gonder revealed that there was similarity in abdominal pain and failure to pass feces and flatus, but had comparable in vomiting (20.9%), abdominal distention (95%) and constipation (39.5%), generalized tenderness (13%) it is lower than in this study. Rectal empty (93.8%) and leucocytosis (95%) it is higher than in this study [6].

From a total of 102 patients who had gone emergency operation with an indication of acute sigmoid volvulus and managed,34(33.3%) of the patients had gangrenous bowel while 68(66.7%) had viable sigmoid colon, intra operatively gangrenous bowel in this study it is higher than study conducted in Sudan (27.3%) and Gonder (24%) but comparable to Attat (32%) [2, 6, 22], it is lower than Tikur Anbessa Teaching hospital (36.1) [23], in case of viable bowel the result is lower than study conducted done in Sudan 72.7% [2].

In this study 78/102(76.5%) were done primary resection and end to end anastomosis the finding was lower than a study conducted in Sudan(100%) ,Pakistan(100%) and Attat Hospital 73 (92.4%),but the finding is comparable to Uganda20 (74.1%) [2, 7, 22, 13].

In this study primary resection and end to end anastomosis 62 /78(79.5%) had viable bowel the finding were higher than from Attat 50/73(68.5%), but 16/78(20.5%) had gangrenous bowel it is lower than study conducted in Attat23 (31.5%)[22].

Five (6.4%) patients were died after primary resection and anastomosis, three were from gangrenous and two of them from viable bowel, it was comparable to a study done in Attat showed that, four (5.5%) patient were died, two from gangrenous and two from viable bowel. [22].

In this study (17.6%) had Hartman's colostomy procedure the result showed that it was highest from Attat (2.5%) [22] ,but comparable to South Africa (14.8%) and Uganda(20.1%) but lower than study conducted inTikuranbessa teaching Hospital(36.1%)[14.13.23].18cases underwent

Hartmann's procedure, had no mortality but a higher morbidity (6:18) it is comparable to South Africa morbidity was (3:8) [14].`The finding of this study was lowest in derotation and deflation (5.9%) from Sudan72.7% and South Africa 12.9% [2, 14].

In this study 77 out of 102 patients (75.4%) with no previous attack, 20/77(25.9%) patients had gangrenous bowel, the finding was comparable with the study done in Gonder Hospital 18 out of 75 patients (24%) with no previous attack had gangrenous bowel. Four out of 25(16%) patients after recurrence had gangrenous bowel it was highest from Gonder Hospital 2 out of 57 (4%) after recurrence had gangrenous bowel [6].

Twenty nine (22.1%) patients were managed with non- operatively or rectal tube deflation, but in South Africa75% successfully decompressed with rectal tube deflation [16].

Most of post-operative complication in this study was wound infection 13 (12.7%), wound dehiscence 6(5.8%), anastomotic leakage4 (3.9%) and intra-abdominal abscess2 (1.9%) was identified from the charts. A study done in Pakistan revealed that wound infection(18.2%) and pelvic abscess were(9.1%) highest compared to this study findings [7].The duration of Hospital stay in this study ranges 3-38days(mean 13.5) in Pakistan the range was 9-24days with mean stays of 12 days [7].

❖ Strength and Limitation:-

- Strength of the study:
  - Used for base line guide for next time
- Limitation of study
  - Quality of data may be affected because retrospective data were used.
  - Hospital based study may not be representative of the prevalence in the whole area.
  - Factors at the community level not addressed

CHAPTER SEVEN:

7. CONCLUSSION AND RECOMMENDATION

7.1 Conclusions:-

The Hospital prevalence of sigmoid volvulus was lowest compared to other studies in this country.

The mortality rate of this study was similar to other study.

Majority of patients with sigmoid voluvulus were in the 6th decades of life and male are more affected.

The most common clinical presentation abdominal pain, abdominal distention & inability to pass feces & flutes are invariably the main presenting complaint and abdominal distention also main presenting physical finding.

Factors associated with poor outcome management of sigmoid volvulus were duration of illness, primary resection and end to end anastomosis and female patients.

The most common management options or performed procedure in this study was primary resection and end to end anastomosis.

Delayed presentation frequently results in poor surgical outcome and/ or long Hospital stay.

Incomplete documentation of medical history, registration books and lost cards.

7.2 Recommendations

Based on the findings of this study, the following recommendations were given to Mettu Karle Referral Hospital, relevant governmental bodies and other responsible bodies.

- When patients who are in their 6th decade of life present with abdominal pain, abdominal distention &inability to pass faces & flatus they need to be assessed for acute sigmoid volvulus.
- Further studies should be conducted on the large scale prospective study is recommended to identify patient, socio-cultural and socio-economical determinants of sigmiod volvulus.
- In your Hospital emergency primary resection and end to end anastomosis is high both viable and gangrenous bowel rather than other performed procedure and *leads* to poor outcome so different management options could be performed.
- Increasing referral linking and community awareness for early medical seeking behavior.
- Strengthens record and documentation system.

References

1. Nuhu A, Jah A. Acute sigmoid volvulus in West African population. Ann Afr med.2010, 9(2):86
2. Domi EA, Mohamed MI, Awadalla MA, Bakhit YM. Emergency laparatomy for acute sigmoid volvulus in EI obeid Hospital western sudan.Sudan JMS 2007, 2(3)
3. Turan M, Sen. M, Karadayi K et al.Our sigmoid colon volvulus experience and benefits of colonoscope in detortion process .EspEnfermDig.2004, 96(1):325
4. Tracey DA. Colonic volvulus .Association of colon and rectal surgeons' convention Chicago. June 2002
5. Macutkiewicz C, Carlson GL. Intestinal Obstruction. Surgery International 2005, 70: 10-14.
6. Ali MK. Treatment of sigmoid volvulus; Experience in Gondar, North West Ethiopia.Ethop Med J 1998, 36:17
7. Nasir M, Khan IA. Resection and primary anastomosis in the management of acute sigmoid volvulus. Pakistan J Surg 2008, 24: 95-7
8. Margolin DA, Whitlow CB. The pathogenesis and etiology of colonic volvulus. Sem Colon Rectal Surg 1999, 10:129-138.
9. JumbiG,Kuremu RT. Emergency resection of sigmoid volvulus in Kenya. East Afr. Med. J. August 2008, 85: 8
10. Kotisso B, Bekele A; A three years comprehensive retrospective analysis of Ileo-sigmoid knotting in Addis Ababa. Ethiop. Med 2006, 44(4): 377-83
11. Tegegne A. Cultural bowel patterns and sex difference in Sigmoid Volvulus morbidity in Ethiopian hospital. Trop Georgr Med 1965, 47: 212
12. Suleman A ,Kessf A, AyhanKM. Sigmoid volvulus: long-term surgical outcomes and review of the literature in AnkaraTurkey.Afr.Jsurg 2012, 50(1):9-15
13. OkelloTR, Ogwang DM, KisaP,KomagumP. Sigmoid Volvulus and Ileosigmoid Knotting at St. Mary's Hospital Lacor in Gulu, Uganda. East Cent. Afr. j. surg 2009, 2
14. Bhuiyan, M.M.Z.U, Machowski, Z.A, Linyama, B.S.et al. Management of sigmoid volvulus in Polokwane-Mankweng Hospital. S Afr J Surg. 2005,43(1):17-19

15. IqbalT,ZarinM.Results of primary closure in the management of gangrenous and viable sigmoid volvulus inNorth West Frontier Province of Pakistan. Pakistan J surg 2007, 23(2)-90.
16. Tan KK,ChongCS,SimR.Management of acute sigmoid volvulus: an institution's experience over 9 years.World J Surg.2010, 34(8):1943-8
17. CirocchiR,FarinellaE,FrancescoL.The sigmoid volvulus: surgical timing and mortality for different clinical types. *World J Surg.* 2010, **5**(1):10-1186
18. Swenson BR, Kwaan MR, Burkart NE, Wang Y, Madoff RD, Rothenberger DA. Colonic volvulus: presentation and management in metropolitan Minnesota, United States. Dis Colon Rectum. 2012, 55(4):444-9.
19. Irabor DO. Acute sigmoid volvulus: experience with primary resection and anastomosis in a tropical African population. J Chinese Clin Med 2008, 3: 343-6.
20. Heis HA, Bani-Hani KE, Rabadi DK, et al. Sigmoid volvulus in the Middle East. World J Surg 2008, 32: 459-64.
21. Mehari H. Management of sigmoid volvulus in Eritrea. MS thesis. Genève University. 2002.
22. Poovan P, mohamed. Sigmoid volvulus management in rural hospital in Ethiopia. East Cen Afr J surg, 2001.
23. Bekele A. Kotisso B, Tesfaye M. Patterns and indication of colostomies in Addis Ababa, Ethiopia. Ethiop Med J. 2009, 47(4):285-9.
24. Javors BR, Baker SR, Miller JA. The northern exposure sign: a newly described finding in the sigmoid volvulus. AJR 1999, 173: 571-4.
25. Ghariani B, Houissa H, Sebai.F .Management of sigmoid volvulus. Tunis Med. 2010, 88(3):163-7
26. Gordon AN. Lorenzi B, Lim J, CristaldiM.Laparoscopic-assisted endoscopic sigmoidopex in Oxford Radcliffe Hospital: anew surgical option for sigmoid volvulus. Dis Colon Rectum. 2011, 54(5):645-7.

Annex

Checklist

JIMMA University, college of health sciences

Instruction: This is to collect data from patient records in Mettu Karl referral Hospital, Oromia region, south west Ethiopia December 2009 E.C. to assess the pattern and management outcome of sigmoid volvulus.

N.B-: Dear data collectors! Please keep the patient privacy and confidentiality during all data collection periods.

1. Card no, _____
2. Name of data collector_____
3. Name of the supervisor_____

I Sociodemographic profile

1. Age

1. ≤19 2. 20-29 3. 30-39
4. 50-59 5. ≥60

2. Sex 1. Male 2. Female

3 . Occupation

1. Farmer 3.Goverment employee
2. Merchant 4.Student 5.other

4. Religion

1. Orthodox 2.muslim 3. Protestant 4.others

5. Residence 1.Rural 2.urban

II.Clinical characteristics of the patient

6. Duration of the onset of illness in hrs…

1 .≤ 24hrs 2. >24hrs

7. Which of sign and symptoms does the patient have?

1. Colicky abdominal pain
2. Abdominal distention
3. Unable to pass faces & flatus
4. Vomiting
5. Rectal empty
6. Constipation

8. Which sign of non viable bowel does the pt have

1. Abdominal tenderness 2.v/s derangement
3. Leucocytosis 4. RDE blood on exam. Finger
5. none

9. How was the patient diagnosed?

1. Clinically 2. Abdominal x-ray 3. Contrast enema 4. CT-scan

Type of procedure done for the patient

10. Rectal tube deflation

1.yes 2.no

11. Resection with primary anastomosis

1. yes 2. no

12. Resection with Hartman's colostomy

1. yes 2.no

13. Reduction & pexy

1. yes 2 no

14. Laparotomy and derotetion

1. Yes 2.no

Type of indication

15. 1. Failed non operative treatment

1.yes 2.no

16.2 Signs of peritonitis

1.yes 2.no

17. Type of intraoperative finding

1. Gangrenous bowel

1.yes 2.no

18. Viable bowel

1. Yes 2.no

19. Intra operative duration in hrs…….

1. ≤ 90minuts 2. Greater than 90minuts

20. Any postoperative complication

1. Anastomotic leak 2. Wound dehiscence 3.Intraabdominal abscess

4. Wound infection. 5. No complication 6.0thers

20. Duration of hospital stays in days.

1. ≤ 7 days 2. >7days

21. Outcome on discharge

1. Good 2. Poor

22. Death

1.yes 2.no

23. Re- laparotomy performed

1. yes 2.No.

Past clinical characteristics of the patients

24. Did the patient have the same history?

1. Yes 2. No

25. How many times it occur

1. Once 2.Twice 3.Three times

4. four times 5.five times 6.no occuranc

26. If the response to Q -1 "Yes", how was the patient treated?
1. Rectal tube deflation
2. Laparotomy and derotation
3. None

27. Did the patient have hx of abdominal surgery? (For any other)
1. Yes 2.No

Declaration

I, the undersigned, declare that this thesis is my original work, has not been presented for a degree in this or any other university and that all sources of materials used for the thesis have been fully acknowledged.

MSC candidate: Seble Awlachew

Signature:_____Date……..

Name of institution:- Jimma University

The thesis has been submitted for examination with my approval as university advisor:-

1. Dr Gersam Abera (General surgeon)

   Signatur----------

2. Mr Demeke Kifile (MSC)

   Signature _____

   Date _____