

**EMERGENCY SURGICALLY TREATED OPERATIVELY NON
TRAUMATIC ACUTE ABDOMENS IN NEKEMTE REFERRAL
HOSPITAL, OROMIA ETHIOPIA A RETROSPECTIVE STUDY (2003-
2005E.C).**

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**A THESIS SUBMITTED TO THE HEALTH RESEARCH AND
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ABSTRACT

Background- *Acute abdomen is an acute onset of abdominal disease entities that require immediate surgical intervention in most of the cases. The causes of non-traumatic surgical acute and their relative incidence varies in different populations. Intestinal obstruction and acute appendicitis are the leading causes of non-traumatic surgical acute abdomen in African countries and developed world respectively. Hernia and volvulus are the leading causes of intestinal obstruction in Africans whereas adhesion in the developed world. There are only few studies on non-traumatic surgical acute abdomen in Ethiopia. .*

Objective: *The aim of this study was to determine the magnitude and the common causes as well as presenting features and the outcome of non-traumatic surgical acute abdomen in NRH, Oromia region, Ethiopia.*

Methods:- *A three years hospital based cross sectional study design was used from January 1, 2011 to December 31, 2013 and the data was collected from MAY;10-25,2014. The data of sampled patients' records were collected from medical records. The collected data were checked for any inconsistency coded and entered into SPSS version 20.0 for data processing and analysis. Descriptive, binary and multivariate logistic regression analyses were used. On binary logistic regression analysis a p-value < 0.25 was used as a candidate for multivariate logistic regression analysis. Statistical significant association was tested at a p-value of < 0.05.*

Results: - *There were 295 (71.95%) non traumatic surgical acute abdomens operatively treated from the total of 410 surgically treated acute abdomens. Out of 295 patients, 230 were males and 65 were females. The age ranged from 6 months to 80 years with a mean age of 33.7±18.6 years. Out of 295, (57.6%) was rural and 46.4% were urban dwellers. More than 50.80% of patients came within 2 days of illness and 49.20% came more than 3 days of illness. The three top causes of non-traumatic surgical acute abdomen were acute appendicitis 140 (47.46%), bowel obstruction 118 (40%) and Peritonitis 36 (12.50%) (Other than gangrenous bowel obstruction and perforated appendicitis). Abdominal pain (99.66%), vomiting (95.25%), constipation (57.96 %) and distension (54.86%) were the main presenting symptoms. Most of patients came late and rural dwellers developed peritonitis. The three commonest early postoperative complications other than death were wound infection 23 (7.80%), pneumonia 9 (3.06%) and sepsis 7 (2.37%) and there were a total of 9 (3%) deaths.*

Conclusion and recommendation: - *Acute abdomen is a surgical condition with high rate of morbidity and mortality if not managed timely and appropriately. Complications were more in cases from rural area due to delay at presentation and no operation facility and surgeons for solutions. To alleviate this problem creation of health awareness on acute abdomen to the general population in general and to the low and mid-level health care providers for early referral has great importance. Assigning properly trained MSc emergency surgeons with full resources should be available at the periphery health institutions.*

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Acronyms

AA- Addis Ababa

AAA- Abdominal Aortic Aneurism

DPL - Diagnostic Peritoneal Lavage

LBO- Large Bowel Obstruction

NRH-NEKMETTA REFRALE Hospital

PPUD - Perforated Peptic Ulcer Disease

REEA-Resection and End-End Anastomosis

RESA-Resection and End-Side Anastomosis

SBO- Small Bowel Obstruction

TAH- Tikur Ambessa Hospital

ZMH - Zewuditu Memorial Hospital

AOR-adjusted odd ratio

CT-confidence interval

COR-crud odd ratio

GUH-Gondar University Hospital

CHAPTER ONE: Introduction

1.1 Background

Acute abdomen is the *most common* presenting surgical emergency. It has been estimated that at least 50% of general surgical admissions are emergencies and 50% of them present with acute abdominal pain. Acute abdomen' is a term used to encompass a spectrum of surgical, medical and gynecological conditions, ranging from the trivial to the life-threatening, which require hospital admission, investigation and treatment. The acute abdomen may be defined generally as an intra-abdominal process causing severe pain requiring admission to hospital, and which has not been previously investigated or treated and may need surgical intervention (1).

The mortality rate varies with age, being the highest at the extremes of age. The highest mortality rates are associated with laparotomy for unrespectable cancer, ruptured abdominal aortic aneurysm and perforated peptic ulcer. Most common causes in any population will vary according to age, sex and race, as well as genetic and environmental factors [1-4].

Intestinal obstruction has been the leading cause of acute abdomen in several African countries where as acute appendicitis is the most frequently seen cause in the developed world [3-7]. The leading causes of intestinal obstruction in Africans have mostly been hernia and volvulus whereas adhesions are most frequent in the developed world [7-13]. There are, however, some African studies which are pointing to a change in these established patterns [14, 15].

1.2 Statement of the problem

Surgical acute abdomen is one of the commonly encountered emergencies in the practice of general surgery and for which emergency surgical operation commonly performed. Acute appendicitis, intestinal obstruction and perforated peptic ulcer disease (PPUD) are the leading cause of acute abdomen. Despite of modern surgery is being practiced; the mortality rate following acute abdominal surgical emergencies is still high. The overall mortality was 4.2% and the rate increased significantly in patients aged > 60 years. Postoperative mortality was 5.8% while mortality rate in non-operated patients was 2.8%. The causes of preoperative death included perforated peptic ulcer, abdominal malignancies (15.4%) and urgent colonic resections (9.4%) [16].

Emergency procedures generally are associated with increased morbidity and mortality rate in elderly patients (the overall mortality was 22%) [17].

The magnitude of non-traumatic surgical acute abdomen is different in deferent areas due to socioeconomic, demographic factors and diet habit. In addition to this, the incidence of post-operative complications varies in different regions and setups. There is no literature that indicates the magnitude, causes, postoperative complication and final outcomes of patients who were managed operatively for the diagnosis of non-traumatic surgical acute abdomen in NRH even in Oromia Region.

Knowing the magnitude and common causes as well common presentations of non-traumatic acute abdomen has great advantage for early clinically diagnosing and to give more emphasis on diagnosis and management time.

Non traumatic surgical acute abdomen is common and relatively non preventable emergency, but if diagnosed and managed early, postoperative complications and final outcome of death can be highly reduced.

CHAPTER TWO:Literature review

Study in Sinai Hospital, in Tehra, Iran shows that a total of 139 patients diagnosed with acute abdomen underwent emergency Laparotomy. According to this research result. Acute appendicitis was the most common cause of acute abdomen (56.8%). Acute appendicitis was the etiology of acute abdomen in 67% of male and 38.8% of female patients. Other common causes of acute abdomen were 14.4% peritonitis among which 5.7% resulted from PPUD, (3.5%) were perforated appendicitis, 1.4% pancreatitis, 7.2% Cholecystitis. Bowel obstruction 7.2% of which 2.2% adhesion and volvulus each, 1.4% incarcerated hernia and only 0.7% case of intussusception found [18].

Study conducted on 190 cases at Kamuzu Central Hospital (KCH) in Lilongwe, Malawi, during the calendar year 2008 Sixty-nine percent were male. The average age was 35 (median 32, range 10-84). The youngest subject was 10, and 10 subjects were under the age of 18. The most common etiologies were appendicitis (22%), intestinal volvulus (17%), perforated peptic ulcer (11%) and small bowel perforation (11%). The overall mortality rate associated with peritonitis was 15%, with the highest mortality rates observed in solid organ rupture (35%), perforated peptic ulcer (33%), primary/idiopathic peritonitis (27%), tubo-ovarian abscess (20%) and small bowel perforation (15%). Factors associated with increased mortality include age, gender, symptoms (constipation, vomiting) and symptom duration (19).

Study conducted in Tikur Anbessa Hospital (TAH) shows that from a total 2149 adult laparotomies, 587(36.4%) were surgical emergency operations for acute abdomen. Acute appendicitis was the leading cause of acute abdomen which accounts 52%, of whom (67%) was males and (33%) females. The majority of cases were in their 2nd and 3rd decades of life. Small bowel obstruction due to adhesions and volvulus were the leading causes of intestinal obstruction each accounting for 27%. Adhesion was the most frequent cause of small bowel obstruction (51.5%). Twelve had previous surgery, four were managed conservatively and 13 were operated out of which four had died. Sigmoid volvulus was the leading cause of colonic obstruction (58.6%) of which 41.2% had simple volvulus and 58.8% gangrenous sigmoid volvulus.

PPUD was the 3rd most common cause of acute abdomen identified accounting for 9% of cases, for which simple closure with omental patch was done [16].

A retrospective analysis on 229 cases of acute surgical abdomen surgically managed at Yirgalem Hospital shows that SBO ranked the first and it was mainly due to volvulus followed by acute appendicitis and LBO which was mainly due to sigmoid volvulus. Typhoid perforation, primary peritonitis, perforated gastro duodenal ulcer, abdominal tuberculosis and empyema of the gallbladder in that order were the other observed causes of acute surgical abdomen. Analysis based on the specific causes of acute abdomen is of great value for early diagnosis and prompt treatment in clinical practice [13].

Four year retrospective study at Gondar University Hospital shows that emergency laparotomies for non-traumatic acute abdomen were 43.3% of all laparotomies. The leading operative diagnoses were SBO (43.4%), appendicitis (34.6%) and LBO (11.5%). Majority of surgically treated acute abdomen patients were from rural areas (58.2%). Abdominal pain (100%), Vomiting (90.3%), abdominal distension (58.3%) and constipation (55.3%) were the commonest symptoms in patients with acute abdomen. Seventy-seven (26.6%) of operated patients had early (in-hospital) postoperative complications [17].

Three years retrospective study done at Zewuditu Memorial Hospital (ZMH) on 653 patients with the diagnosis of acute abdomen of which 277 clinical diagnosis of acute appendicitis, Out of the (72.6%) were males and (27.4%) were females, giving male to female ratio of 2.6:1. The age at presentation ranged from 13-75 years with mean ages of 25.6 years. The majority of cases, (76.5%) occurred between the ages of 13 and 30 years. Appendicitis thought as uncommon cause of acute abdomen in Africa. This study has shown that acute appendicitis is not a rare disease in Africa. The clinical presentation of abdominal pain in all patients with a shifting pain in (80.5%) of cases and associated vomiting in (76.9%) (13).

In a retrospective study conducted at Gondar hospital, North Ethiopia on previous 3 year admissions of patients presenting with emergency intestinal obstruction(n=145) it was observed that Sigmoid volvulus (SV) was the commonest cause (56%). The mean age was 55 +/- 13 years, (Age range 10-80), and 13.5 for males and 1 for females. 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 derotation 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. [7]

The study conducted at Attat hospital, central Ethiopia between 1980 and 1993. About 79 patients with sigmoid volvulus were managed, of which there were 70 males and 9 females. The youngest patient was aged 25 and the oldest was 75 years old, with a mean age of 53 years. Gangrenous bowel was present in Twenty five (32%) of the patients while the rest (68%) had viable gut. The operative procedures performed included derotation or resection with primary anastomosis, or resection with colostomy. Of the 54 with viable bowel, four (7%) were managed with derotation alone. Of these four, one was lost to follow up, while the other three presented with recurrences and were readmitted after 3 months, 8 months and after 8 years. They were managed with resection and primary anastomosis. Of the 54 patients with viable gut, 50 (93%) were managed by resection and primary anastomosis and 4 were managed by derotation alone. Of the 25 with gangrenous bowel, 23(92 %) were managed with resection and primary anastomosis and two were managed with resection and colostomy. There were 4 deaths among the patients who had primary resection and anastomosis, with a mortality rate of 5.5%.

The mortality among those who had viable gut was 4% (2 deaths out of 50) in comparison with the 9% (2 deaths out of 23) among those with gangrenous sigmoid colon. There were no deaths among patients who had derotation alone or resection and colostomy. [8]

2.2 Significance of the study

Acute abdomen is one of the surgical emergency cases that cause major mortality & morbidity if not managed early and appropriately. Thus, having enough knowledge about its pattern, mortality and morbidity has advantage in decreasing complications associated with acute abdomen by appropriate early interventions.

This study will have advantage by providing baseline information about the magnitude and causes of acute abdomen and its management outcome in our country for minimizing morbidity and mortality of patients by early prediction and detection for early initiation of resuscitation and definitive management on time before complications occurs because operating patients after complication occur has poor prognosis. It will also have significant advantage for health professionals and other concerned body in that it will add useful information about acute abdomen.

The result of this study will also add epidemiological and clinical information that will serve as an essential input for policy makers to design proper strategies and also helps as references for those who want to undertake researches on the prevalence and causes of acute abdomen there was no adequate study conducted in our country which deals about it. There is also an attempt to publish the outcome of the research result.

2.3 Conceptual framework

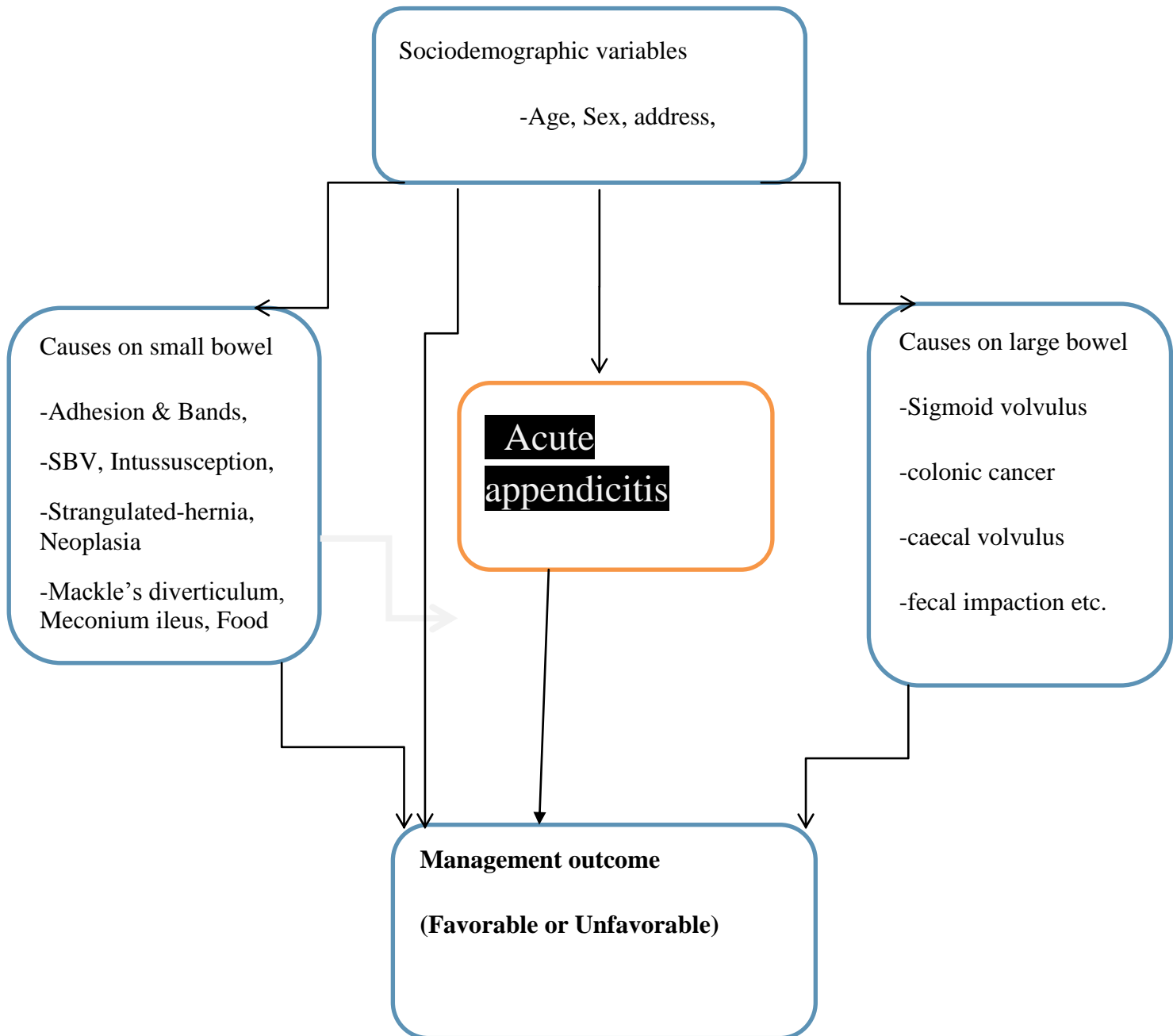


Figure 1: Conceptual framework on management outcome of non-traumatic acute abdomen

CHAPTER THREE: Objectives

3.1 General objectives

- To determine the magnitude of surgically treated operatively non traumatic surgical acute abdomen in general, the common causes as well common presenting features and the outcome of emergency laparotomies for non-traumatic surgical acute abdomen.

3.2 Specific objectives

- ✓ To determine the magnitude of emergency surgically treated operatively non traumatic surgical acute abdomen in NRH.
- ✓ To identify the causes of non-traumatic surgical acute abdomen leading to emergency laparotomies.
- ✓ To determine the common presenting features of surgically treated non traumatic surgical acute abdomen.
- ✓ To determine the outcome of emergency laparotomies done for non-traumatic surgical acute abdomen.

CHAPTER FOUR: Methods and materials

4.1 Study area and study period

The study will be conducted in NRH, which is found in Nekemte town, at a distance of 331km from the capital Addis Ababa to the west. The hospital is serving for a total population of about 2.1 million peoples of nekemte town, east wollega zone, part of west wollega, horoguruud zone & west show zone. Currently NRH 178 beds used for the inpatient services. as to the humane resource there are total number of workers 113 health Professionals & 78 administrative staffs.

The hospital provide medical treatment , ophthalmic treatment, major & minor operation , inpatient services, MCH, control HIV, X-ray, laboratory , phsycatric treatment ,ultrasound, drug pharmacy, training services & physiotherapy.

4.2 Study Design

A three year retrospective descriptive cross sectional study from secondary data was employed in NRH.

4.3 Source Population

All patients are for whom surgical operation was performed for non-traumatic surgical acute abdomen in NRH.

4.4 Study Population

All patients for whom emergency Laparotomy was done for the diagnosis of non-traumatic surgical acute abdomen in the years 2003-2005.

4.5 Study Unit

Individual patients' medical cards in which patients' medical history registered for patients for whom operation done for diagnosis of non-traumatic surgical acute in the year of 2003 - 2005.

4.6 Sample size determination

All 295 operated patients for non-traumatic surgical acute abdomen during the year 2003-2005 taken as the sample size

4.7 Inclusion and Exclusion criteria

4.7.1 Inclusion criteria

All cases who were operated for the diagnosis of non-traumatic surgical acute abdomen during the study period.

4.7.2 Exclusion criteria

- Patients whose intraoperative diagnosis was other than non-traumatic surgical acute abdomen despite of preoperative diagnosis
- Patients with diagnosis of non-traumatic surgical acute abdomen and who were operated out of NRH and admitted after operation to NRH.

4.8 Variables

4.8. 1. Dependent Variables

- Post operative complications
- Outcome on discharge

4.8.2. Independent Variable

- Age
- Sex
- Place of residence
- Operative diagnosis
- -Type of procedure
- -Duration of illness before operation
- -Clinical features
- -occupation
- -duration of hospital stay

4.9. Data collection methods

4.9.1. Data collectors and supervisor

For data collection two clinical nurses were recruited outside of nekmata refrale hospital staffs. The Principal investigator gave training for data collectors on how to fill the prepared checklist, the importance of data quality and the relevance of the study. One first degree holder clinical Nurse has been supervising the daily activity, consistency and completeness of the checklist and appropriate support was given during the data collection process. The Principal Investigator had checked the daily activities of data collectors and supervisor.

4.9.2. Data collection techniques

Patients that were admitted to surgical wards of NRH with the diagnosis of acute abdomen and treated operatively from January 1, 2011-December 30, 2013 G.C were initially identified from admission log-books of surgical wards and operation theater of NRH from which card number of patients were obtained. Then cards of the patients were identified, collected from card room and was used to collect important information about patients admitted with the diagnosis of acute abdomen.

4.9.3 Data processing, analysis, interpretation and presentation

After data collected, it was coded, entered and cleaned using computer software SPSS windows version 20 and analyzed by using descriptive statistics like Percentages, mean and SD for elementary data analysis. Data was presented by frequency tables and figures. Association between dependent and independent variables was checked by using binary and multivariate logistic regression. On binary logistic regression a p-value < 0.25 was used as a candidate for multivariate logistic regression analysis. Statistical significant association was tested at a p-value of < 0.05 .

4.9.4 Data quality management

- **Before data collection:** The prepared checklists in English will be assessed and commented by research advisors. The facilitators and Supervisor was trained for two days.
- **During data collection :** In order to avoid the interpersonal variation between data collectors, data was collected by the same data collectors throughout the data collection. Regular daily supervision was done for checking the consistency and completeness of the filled out checklists by the principal investigator. The completed checklists were checked for their completeness and consistency at every step of data collection.
- **After data collection:** Before starting data analysis completeness will be rechecked again. Collection and quality control.

4.10. Definitions of terms

- **Appendicitis** --- Inflammation of appendix.
- **Appendectomy** --- Removal of appendix.
- **Cholecystitis** --- Inflammation of gallbladder.
- **Colostomy** --- Connecting the colon to the abdominal wall for stool drainage.

- **Intussusceptions** ---Invagination of one part of bowel lumen in to the other.
- **Laparotomy** --- Incision through the abdominal wall
- **.Peritonitis** --- Inflammation of peritoneum
- **Acute abdomen-** is any sudden condition with chief manifestation of pain of recent onset in the abdominal area which may require urgent surgical intervention.
- **Intestinal obstruction (IO)** - Intestinal obstruction is prevention of passage intestinal contents.
-
- **Wound dehiscence:** is facial disruption due to abdominal wall tension overcoming tissue or suture strength, or knot security. It can occur early or late in the postoperative period, and involve a portion of the incision (i.e., partial dehiscence) or the entire incision (i.e., complete facial dehiscence).
- **Clinical manifestation:** sign and symptom of intestinal obstruction
- **Anastomosis:-**the surgical union of two hollow organs, e.g. parts of the intestine, to ensure continuity of the passageway and anastomosis leak refers to leakage through surgical union site.
- **Intraoperative procedure:** The procedure that can be done after laparotomy was done which can be resection & anastomosis or colostomy or etc. depending on the causes& intraoperative finding of obstruction.
- **Intraoperative finding:** The finding after abdomen is opened which can be gangrenous bowel or viable bowel and etc.
- **Non operative management:**means management of patients with partial bowel obstruction, recurrent adhesive obstruction, or during the early postoperative period with NGT suction, IV fluids and frequent clinical reassessment to rule out bowel strangulation which may need operative management
- **Operative management:** means surgical exploration of the abdomen which is determined by the number of peritoneum.

4.11 Ethical Considerations

Ethical approval of the research proposal will be obtained from the ethical review committee of Jimma University. A formal letter was written from the coordinator of Integrated Emergency Obstetrics/Gynecology and surgery to the hospital administrator office. The Hospital medical director permitted us to conduct the study. The data was collected by review of the registration books using structured checklists. The filled checklists will be destroyed,

some years after the study has finished. Until that it will be kept carefully in the hand of principal investigator.

4.12. Dissemination of the results

After complete the result of the study will be submitted to the collage of public health and medical science of Jimma University, Nekemte referral hospital and other responsible bodies. The result will be presented during thesis defense in the collage of public health and in different seminars, meeting, conferences and workshops. Moreover, efforts will be done to publish the findings of the study and disseminated through different journals and scientific publications.

CHAPTER FIVE: Results

5.1: Socio-demographic characteristics

Three years retrospective study conducted on pattern of emergency operations performed for non-traumatic surgical acute abdomen in NRH in Nekmeta, ESTE Oromia, and Ethiopia. There were a total of 295 surgical emergency laparotomies for non-traumatic surgical acute abdomen. Two hundred ninety five cases were retrieved which made the basis of this study. There were 230 (78%) male and 65 (22) female (Table 1). The age ranged from 6 months to 80 years with a mean age of 33.72 ± 18.65 years. 158 (53.6%) patients were rural and 137 (46.4%) patients were urban dwellers. More than 50.8% of patients came within 2 days of illness, 29.50% within 2-5 days, 10.8% within 5-7 days and less than 8.1% came more than 7 days of illness. Abdominal pain (99.66%), vomiting (95.26%), constipation (59.26%) and abdominal distension (56.89%) were the main presenting symptoms (Fig.3). The three top causes of acute abdomen (Fig. 2) were acute appendicitis accounting 140 (47.46%), followed by bowel obstruction 118 (40%) and Peritonitis other than gangrenous bowel obstruction and perforated appendicitis 36 (12.20%).

Table 1: Socio-demographic characteristics of patients with acute abdomen in nekmeta refrale hospital from January 1, 2011 – December 30, 2013

Variable	Frequency	Percent
Age		
<14 years	65	22.0
15-24 years	35	11.9
25-34 years	35	11.9
35-44 years	41	13.9
45-55 years	30	10.2
>55 years	89	30.2
Total	295	100.0
Sex		
Male	230	78
Female	65	22
Total	295	100.0
Residence		
Rural	158	53.6
Urban	137	46.4

Total	295	100.0
Occupation		
Farmer	142	48.1
Housewife	16	5.4
Merchant	21	7.1
Student	84	28.5
Governmental employer	32	10.8
Total	295	100.0

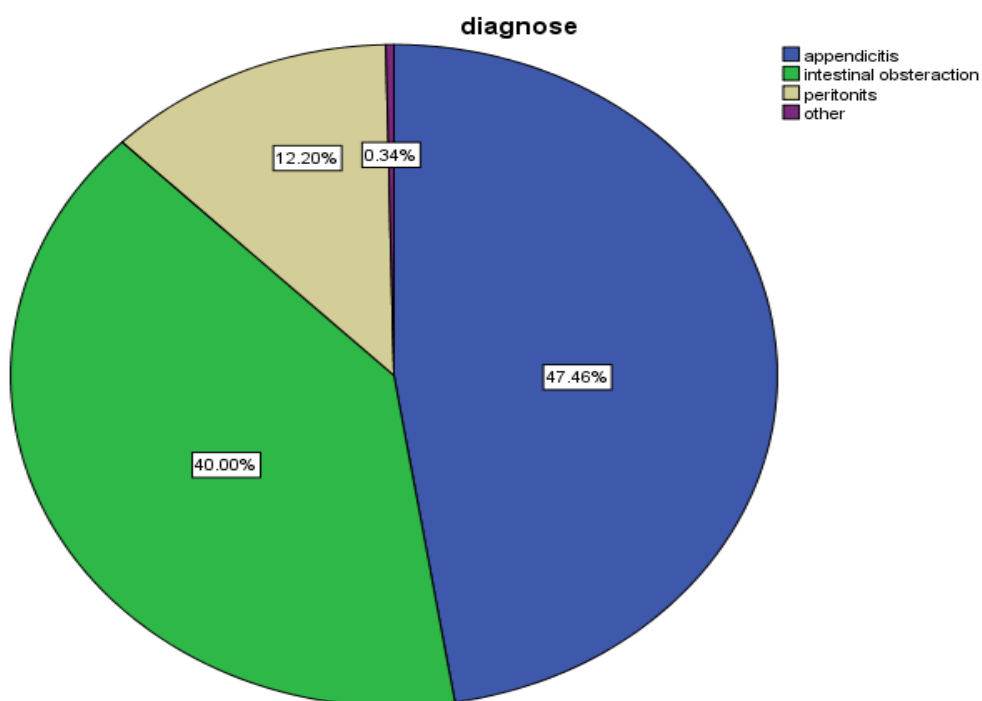


Figure 2: Frequency of the causes of emergency surgically treated non-traumatic surgical acute abdomen in NRH during the year of September 2003- August 2005 (n=295).

5.2 Appendicitis

Among 140 cases of appendicitis 98 (70%) were males and 42 (30%) were female. Abdominal pain 140(100%), nausea 135(96.43%) and vomiting 128(91.43%) were the main complaints of appendicitis (Fig.3). Appendicitis was high in prevalence in 2nd

(81.36%) and 3rd (54.28%) decades from surgically treated operatively non traumatic surgical acute abdomen and low in both extreme age groups.

Acute appendicitis accounts 74(52.86%) of appendicitis followed by Appendiceal abscess 38 (27.14%) and perforated appendicitis 28 (20%). Appendiceal abscess was high in elder age groups (>60years=50%) where as low in 1st decade and Perforated appendicitis was high in two extreme age groups (42.86% in 1st decade and 33.35% in >6th decades).

Wound infection was the commonest post-operative complication of appendicitis 14(10%) followed by pneumonia 3 (2.14%) and sepsis 1 (0.74%)(Fig.2). from total appendicitis cases there were 3(2.22%) deaths of these 66.67% were from age group of >60 years and those who came after 7 days. The management and death outcome of appendicitis depends on the types of appendicitis (**Table .2**).

Table-2 Procedures and death prevalence for different form of appendicitis in NRH in the years of September 2003-August 2005 (n=140)

Types of appendicitis	Appendectomy only		Appendectomy + Drainage		Drainage only		Appendectomy + Lavage		Total
	improved	Died	Improve d	Died	improved	Died	improv ed	Died	
Acute appendicitis	74	0	0	0	0	0	0	0	74
Appendicle abscess	0	0	17	1	19	1	0	0	38
Perforated appendicitis	0	0	0	0	0	0	27	1	28
Total	74	0	17	1	19	1	27	1	140

5.3 Obstructions

5.3.1 Small bowel Obstruction

Small bowel obstruction was the leading cause of bowel obstruction which accounts 75(63.56%) of bowel obstruction of which 43(57.33%) were primary small bowel volvulus, 13(17.33%) were hernia, 12(16%) were adhesion/band and 6(8%) were

intussusceptions (Table 3). The common symptoms were abdominal pain and vomiting in 100%, constipation and distension each seen in (94.67%) and (91.99%) of patients respectively (Fig.3).

Out of 75 small bowel volvulus, 88% were males and 12% were females, and majority of cases were in the 1st decade especially intussusceptions was completely in this age group. Fifty four (72%) of SBO cases were found to be viable and 21(28%) were nonviable. Of 21 cases of nonviable SBO, 14(66.67%) and 7(33.33%) were managed by REEA and RESA respectively and the viable ones managed accordingly.

Among 43 cases of primary small bowel volvulus, 32(74.42%) cases were viable and 11(25.58%) were non-viable for which derotation plus milking and REEA done respectively. Thirty eight cases were males and 5 were females with 2.47:1 similar ratio of male to female and rural to urban.

The 2nd leading cause of SBO was hernia and 9(69.23%) were viable 4(39.77%) were strangulated for which reduction plus defect repair and REEA done respectively. All of these are males and from rural.

Eight cases of adhesion/band were viable and 4 were non-viable. The sex distribution was almost equal and rural-urban ratio was 3:1.

All of viable cases managed by simple adhesionolysis and band release whereas non-viable ones by REEA.

All of 6 cases of intussusceptions were ileo-colic and 5 were males and from rural and 1 female and from urban and all of were in 1st decade. Five of these were viable and 1 non-viable managed by simple reduction and RESA respectively. Wound infection (4), leak (4) and sepsis (2) were the main early post-operative complications in SBO.

There were 2(2.67%) deaths of which 1(4.76%) was from non-viable SBO and 1(1.85%) from viable SBO

Table-3 the frequency of causes of SBO in NRH from September 2003-August 2005.

Cause of SBO	No. Of cases	% from SBO	% from total obstruction
Small bowel volvulus	43	57.33%	36.44%
Hernia	13	17.33%	11.02%
Adhesion/band	12	16%	10.17%
Intussusceptions	6	8%	5.08%
Other	1	1.33%	0.93%
Total	75	100%	63.56%

Table 4: The frequency type of procedure of SBO in NRH from September-2003-august 2005

Type of procedure	Frequency	Percent	Valid Percent	Cumulative Percent
REEA	20	6.8	27.0	27.0
derotation&milking	32	10.8	43.2	70.3
simple redaction &repair	14	4.7	18.9	89.2
Adhesionolysis	8	2.7	10.8	100.0
Total	74	25.1	100.0	

5.3.2 Large bowel obstruction

Sigmoid volvulus was the leading case of LBO (37/86.05%) followed by ileo-sigmoid knotting 5(11.63%) and colorectal CA 1(2.32%)(Table 5). The main presenting symptoms were abdominal pain (98%), constipation (100%), distension (100%) and vomiting (95.35%) of patients (Fig.3) Among 43 cases of LBO, 40(93.02%) were males and 3(6.98%) were females with rural-urban ratio of 3:1 and 28(65.12%) were non-viable and 15(34.88%) were viable.

Twenty five(89.29%) of nonviable LBO and were managed by Hartman's colostomy. Colostomy and ileo-colic anastomosis was done for other 3(10.71%) cases. Most of viable LBO (11cases) was managed by simple derotation and deflation while for 4cases primary REEA done. Wound infection, sepsis, pneumonia accounts 2 in each equally. There were 2deaths (4.65%) all of were after Hartman's colostomy done and from rural.

Table 5; the frequency and causes of LBO in NRH from September 2003-August 2005

Cause of LBO	No. of cases	% from LBO	% /total obstruction
Sigmoid volvulus	37	86.06%	31.36%
Ilieo-sigmoid knotting	5	11.63%	4.24%
Colorectal Ca	1	2.33%	0.85%
Total	43	100%	36.44%

Table 6...the frequency& type of procedure of LBO in NRH from September 2003-august 2005

S.no	Procedure	Frequency	%
1	Hartman's colostomy	25	58.1
2	colostomy& ilieo-colic anastomosis	3	7.0
3	simpile derotation	11	25.6
4	primary REEA	4	9.3
5	Total	43	100.0

5.4 Peritonitis

There were 107 cases that developed peritonitis at the time of operation from different sources. 48(44.86%) of cases were from gangrenous bowel obstructions, 22(20.56%) perforated appendicitis, 14(13.08%) perforated PUD and 11(10.28%) from typhoid perforation while 11(10.28%) were primary peritonitis. Majority of cases of peritonitis were those who came late before operation (Table 7).

The main presenting features of peritonitis were abdominal pain (100%), vomiting (97.65) constipation (78%), and nausea (69.87%)(Fig.3).

Among perforated PUD, 11 were from rural and 3 urban and all were males. Majority of cases were in the age group of 40-60 years. All managed by omental patch and there was one death by the complication of sepsis.

Most cases of typhoid perforation were from rural and in the age group of 1st and 2nd decades. Male to female ratio was 1:2 and repair done for 8(72.73%) cases whereas REEA done for 3(27.27%). There was 1 death from repair due to sepsis secondary to leak.

Ten of 11 cases of primary peritonitis were from rural and the male to female ratio was 1:2. Six (54.55%) managed by lavage plus appendectomy and for 5(45.45%) lavage only done. The total deaths among patients who had peritonitis at time of operation were 6(5.6%) (Fig.5)

Table 7. Peritonitis Vs duration of illness before operation in all patients who had peritonitis at time of operation in NRH from September 2003- August 2005.

Duration of illness before operation	Gangrenous LBO	Gangrenous SBO	Perforated appendicitis	Perforated PUD	Typhoid perforation	Primary peritonitis	Others	Prevalence	Total population
≤2 days	17	9	9	9	1	4	0	49(32.7%)	150
(2-5) days	7	6	8	2	5	4	1	32(36.8%)	87
≥5 days	4	5	5	3	6	3	0	26(44.8%)	58
Total	28(26.2%)	20(18.7%)	22(20.6%)	14(13.1%)	11(10.3%)	11(10.3%)	1(0.9%)	107(36.3%)	295

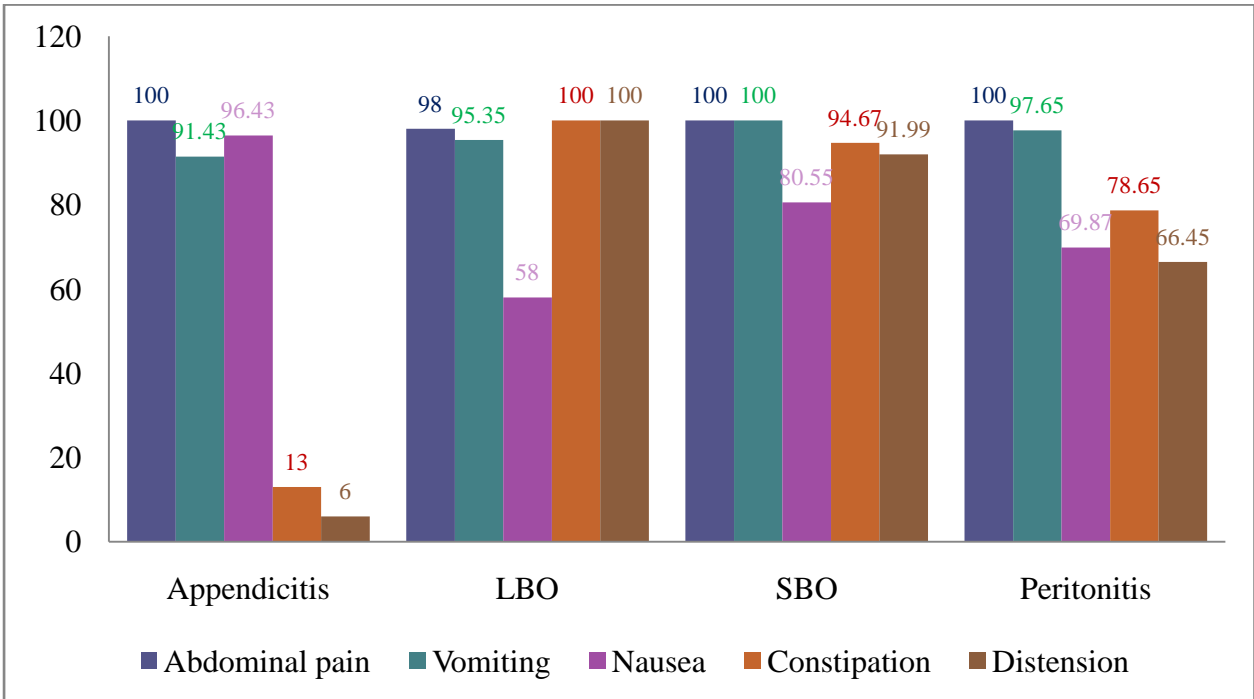


Fig.3. Summary of presenting symptoms of patients who were surgically treated for non-traumatic surgical acute abdomens in NRH in 2003-2005

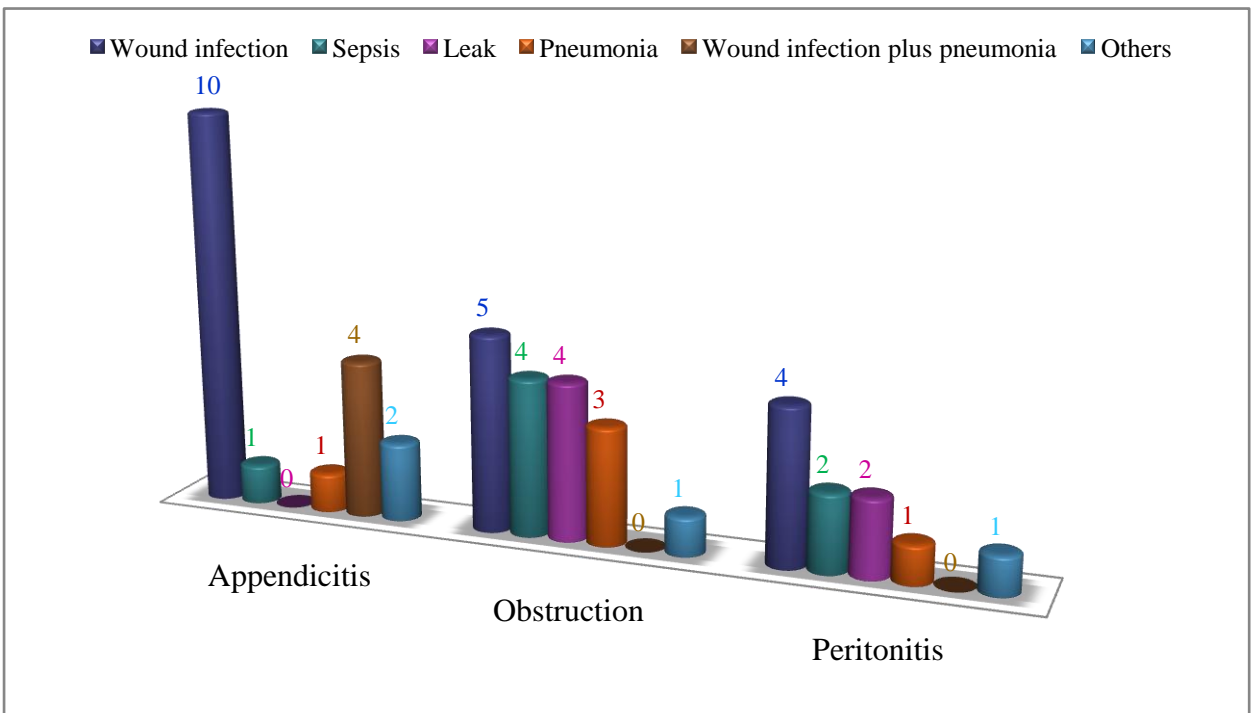


Fig.4 Summary of the frequency postoperative complications in surgically treated surgical emergency acute abdomen in NRH from September 2003-August 2005.

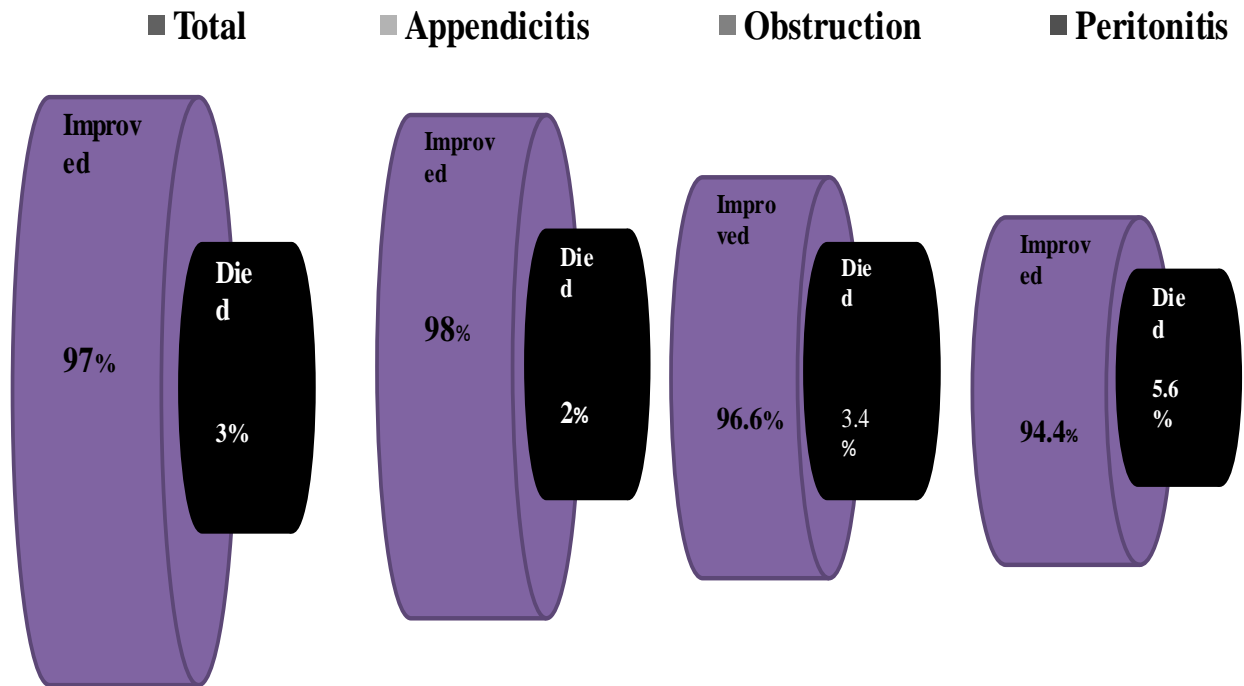


Fig.5 A summary of patients condition on discharge after surgically treated for diagnosis of non-traumatic acute abdomen in NRH from September 2003-August 2005

5.5; Factors associated with management outcome of non-traumatic acute abdomen in NRH

The following table shows 22 variables were analyzed using binary logistic regression. Out of these ages, duration of illness, address post op complications occupation & duration of hospital stay are candidates for multivariate analysis

Table8:bivariate logistic regression analysis management outcomes in NRH September 2003- august 2005

<i>Variables</i>	<i>Management outcomes</i>		COR(95%CI)	P-value
	Favorable	Unfavorable		
<14 years	59	6	8.949(1.050-76.256)	0.045***
14-24 years	33	2	5.333(.468-60.797)	.174
25-34 years	33	2	5.333(.468-60.797)	.174
35-44 years	40	1	2.200(.134-36.066)	.581
45-55 years	29	1	3.024(.184-36.066)	.438
>55 years	88	1		
Sex				
Male	220	10	.	
Female	62	3		
Residence				
Rural	147	11	..198(.043-.909)	.037***
Urban	135	2		
Diagnose				
Appendicitis	138	2		
LBO	41	2		
SBO	74	1		
PERITONITES	28	8		
OTHER	1	1		
DURATION OF ILINESE				
< 2 days	147	3		
➤ 2 days	135	10	.277(.074-1.022)	.054***
Post op complication				
Yes	135	12	84.686(10.681-671.442)	.000**
Occupation				
Farmer	138	4	.203(.048-860)	.030***
Merchant	19	2	.737(.122-4.433)	.739
House wife	14	2	1.009(.163-6.138)	1.000
Student	83	1	.084(.009_.787)	.030***
Governmental employer	28	4		
Length of hospital stay				
≤ 5 days	81	8	.3970(1.261-12.498)	.018***
>5 days	201	5		

5.6; Predictors of management outcomes of non-Traumatic acute abdomen

Numerous associations were found to be significant in the bivariate analysis. Therefore, a multivariable approach was applied to determine which factors best explained and predict management outcome of patient

- ✓ Patient who were <14 years of age were 15.4 times higher more likely to have good mgt outcome as compared with other age group (AOR=15.441,95% CI:1.611-147.980.P=.018)
- ✓ Patient who came from rural area 5 times higher to have bad mgt outcome as compared to patient who came from urban (AOR=7.477,95% CI:1.466-38.46.P=.016)
- ✓ patient who had >2days duration of illness has 3.8 times higher more likely bad mgt outcome as compared to patient who came with <2 days of duration(AOR=4.329,95% CI;1.034-18.127.045)
- ✓ Length of hospital stay has also significant statistical association with management outcome (AOR=0.213, 95%CI: 0.061-0.738, p-value=0.015). Patients who stayed for less than 5 days are less likely to develop unfavorable outcome as compared with patients stayed for greater than 5 days

Table. 9:Bivariate&Multivariate logistic regression analysis management outcomes inNRH September 2003-august 2005

Variables	Management outcomes		COR(95%CI)	P-value	AOR(95%CI)	P-value
	Favorable	Unfavorable				
Age						
<14 years	81	8	8.946(1.050-76.256).	.045	15.441(1.611-147.980)	.018**
Address						
Rural	147	11	.198(.043-.909)	.037	7.477(1.466-38.46)	.016**
Duration of illness						
>2days	131	10	.277(.074-1.022)	.054	4.329(1.034-18.127)	.045**
Length hospital stay						
>5days	201	5	.3970(1.261-12.498)	.018	.213(.061-.738)	.015**

CHAPTER SIX: Discussion

There are very few studies done on the general pattern of acute abdomen in Ethiopia [12,16] and few studies on specific causes of acute abdomen [7,8,9,17]. In this study emergency surgical operation performed for 295 non-traumatic surgical acute abdomens and of these, 230(77.97%) were males and 65(22.03%) were females. Seventy percent of all were rural and 30% were urban residences. Majority of patients were in their 2nd and 3rd decades of life, which was similar with previous studies done in TAH and other African countries [2, 3, 4, 6, 16, 17]. This may be due to the flatus theory that males pass their time in outdoor duties that restricts them to pass flatus and feces for long time and loaded feeding habit per cycle of meal of males. But the opposite is true for females

Almost similarly with study in Gondar University Hospital, abdominal pain(99.66%), vomiting (95.25%), constipation (59.32 %) and abdominal distension (56.89%) were the commonest symptoms in patients with acute abdomen [17].

Acute appendicitis was found to be the leading cause of non-traumatic surgical acute abdomen leading to emergency operation in this study. The majority of the cases with acute appendicitis were from urban and in their 2nd and 3rd decades of life with male to female ratio 3:1 which agree with other studies done in TAH, ZMH, and Sina Hospital [2, 3, 4, 16, 17, 18] but contrast to study done in Gondar University and Yirgalem Hospitals [13, 17] which showed that intestinal obstruction was the leading cause of acute abdomen. This may be explained by due to diet and socio-economic factors that may or may not differ in different areas.

Bowel obstruction was the second most common cause of non-traumatic acute abdomen with 40% of which 75 (63.56%) SBO followed by LBO 43 (36.44%) which was similar with study done in TAH [16]. Primary small bowel volvulus accounting 43(57.33%) from SBO was the leading cause. This contradicted with studies done in TAH, Gondar University Hospital [16, 17] which has shown that adhesion was the leading cause of small bowel obstruction. It is explained by that since adhesion is a secondary problem, (occurs in patients who has history of previous surgery), there may be high operation rate in catchments of TAH and Gondar university. In this study hernia and adhesion were found to be 2nd and 3rd causes of SBO. Out of 75 cases of SBO, 21(28%) were non-viable and managed by resection and anastomosis.

This was most seen in patients who presented late, more than 3 days of duration of illness. This is because when the duration of time increases blood perfusion of bowel decreases finally to death of bowel.

Similar with TAH, in this study sigmoid volvulus was found to be the leading cause of colonic obstruction (86.05%).

In this study most of patients developed peritonitis at time of operation and most of them resulted from gangrenous bowel obstruction (42.59%) followed by perforated appendicitis (20.37%), perforated PUD (12.96%), typhoid perforation (10.18%) and others (10.18%) were primary peritonitis. But contrarily, study on Sina Hospital, showed that 14.4% of patients developed peritonitis, among which 5.7% resulted from PPUD, 3.5% of from perforated appendix [19]. This may be due to late presentation of patients because of different reasons like lack of health awareness, inaccessibility of health institutions where operation is not performed and no trained health staffs who did operations in rural areas.

Similar to study in TAH, Peritonitis was highly seen in patient who came late (>52.34% in 2 days) and from rural areas (83.18%) and the reason for late presentation to the institution delivering the surgical treatment needs to be studied further [16].

More than 49 (16.10%) surgically treated non traumatic acute abdomen patients had one or more early postoperative complications which was lower than TAH study (28%). This may be due to good service of the NRH after patients arrive at hospital. The three commonest early postoperative complications other than death were wound infection 23 (7.80%), pneumonia 9 (3.06%) and sepsis 7 (2.37%) which is low when compared with study done in Gondar University Hospital. i.e. wound infection (20.6%), sepsis (17.6%) and pneumonia (9.9%) but almost similar study in TAH except sepsis was lower in this study [16,17].

The overall mortality rate of emergency surgically treated acute abdomen was 3.05% which is lower than study done in Gondar University Hospital (9.30%), Yirgalem (13.5%) and Datubo (13.3%) and TAH (15.3%) Hospitals [11,12, 16, 17]. In this study the mean hospital stay of expired patients was 2.2 days and the mean age of the expired patients was 53.6 years. Also half of the patients who died were operated for bowel obstruction. All of the patients dying with large bowel obstruction had gangrenous sigmoid volvulus.

Two third of all deaths were those patients who came after 2 days of illness and 77.78% were from rural areas which was similar to TAH study [16].

The mortality rate of 2.14% for appendicitis 2.67% of SBO, 4.65% of LBO and 7.14% of PPUD was very low when compared with study done in TAH, Gondar University hospital and ZMH [13, 16, 17].

LIMITATION

The limitation of this study was that being an institutional study, it might not be representative for NEKMITA population. Since secondary data had been dealt, there were difficulties during data collection like incomplete and unorganized patients history on patients' medical card and unreadable hand writing.

CHAPTER SEVEN: Conclusion and recommendation

7.1 Conclusion

In this study we noticed emergency surgical operation for non-traumatic acute abdomen particularly for acute appendicitis was found to be the most common surgical emergency operations performed in NRH. Non traumatic acute abdomen was more common in rural dwellers and male sex. Most of patients experienced post-operative complications were those who came late and related with developing peritonitis.

7.2 Recommendation

Acute abdomen is a surgical condition with high rate of morbidity and mortality if not managed timely and appropriately. To alleviate this problem OROMIA Regional Health Bureau, particularly NRH should create health awareness on acute abdomen to the general population in general and to all level of health care providers in particular has great importance. As most of the complicated cases with delayed presentation are from rural areas where health institutions with operation theatre and well trained health professionals are not well distributed, cases can be timely handled by properly trained MSc emergency surgeons by assigning them with fully equipped operation theatre. As well since mortality rate was different for different procedures for similar cases, OROMIA Regional Health Bureau in collaboration with NRH, should prepare common management protocol for all health workers

ANNEX 1

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ANNEX 2

CHECK LIST

JIMMA University College of Health Science Department of Medicine

Data collecting Checklist

This checklist is prepared to assess emergency surgical operation performed for acute abdomen in NRH during the year 2003-2005 E.C. This will be filled by the investigator from secondary data (from surgical operation registration book and patients profile card).

Date ----- Card. No-----

Part I. Socio demographic characters			
1.Age	-----in Years		
2.Sex	Male ___1 Female __2		
3.Address	Urban ___1 Rural ___2		
Part II. Presenting complaints of the patient		Yes-1	No-2
	1.Abdominal pain		
	2.Vomiting		
	3.Nausea		
	4.Abdominal distension		
	5.Constipation		
	6.Others		

Part III. Duration of illness in days before operation(in days) _____	
Part (P) IV. Diagnosis	1.Appendicitis
	2.Intestinal obstruction
	3.Peritonitis
	4.Others
PIV1: If Appendicitis,	1.Acute appendicitis
	2.Appendicial abscess
	3.Perforated appendicitis
PIV2: If Intestinal Obstruction	1.Lare bowel
	2.Small bowel
	3.Others
PIV2.1:If large bowel Obstruction	1.Sigmoid volvulus
	2.Colorectal cancer
	3.Ilieosigmoid knotting
	4.Colocolonic intussusceptions
	5.Others
PIV2.1.1:If sigmoid volvulus	1.Viable
	2.Nonviable
PIV2.1.2:If colorectal cancer	1.Viable
	2.Nonviable
PIV2.1.3:If ilieosigmoid knotting	1.Viable
	2.Nonviable
PIV2.1.4:If colocolonicintussusceptions	1.Viable
	2.Nonviable
PIV2.1.5:If others	1.Viable
	2.Nonviable
PIV 2.2: If small bowel Obstruction,	1. Primary volvulus
	2. Adhesion/band
	3. Hernia
	4. Intussusceptions(ilieocolic)
	5. Others
PIV 2.2.1:If primary volvulus	1.Viable
	2.Nonviable

PIV 2.2.2:If adhesion/band	1.Viable
	2.Nonviable
PIV 2.2.3:If hernia	1.Viable
	2.Nonviable
PIV 2.2.4:If intussusceptions(ilieocolic)	1.Viable
	2.Nonviable
PIV 2.2.5:If others	1.Viable
	2.Nonviable

PV3: If peritonitis, what is the primary cause	1.Perforated appendicitis
	2. Gangrenous large bowel obstruction
	3.Gangrenoussmall bowel obstruction
	4.Typhoid perforation
	5. Primary peritonitis
	6.Others(if there mention)

PV4:If others write in short

Part VI.Type of procedure done (write in short)

Part VII: What was the complication postoperatively if any,		Yes-1	No-2
1.Anastomotic leak			
2.Bleeding			
3.Collection			
4.Pneumonia			
5.Sepsis			
6.Wound infection			
7.Others(if any, mention)			

PVII-1:If yes in **PartVII,** -----

what is done (write in short)					
Part VIII. Postoperative hospital Stay(in days)	-----				
Part IX. Condition of the patient on discharge	(1).Improved	(2).Worsened	(3).Referred	(4)Dead	(5).unknown