

ASSESSING THE PREVALENCE AND TREATMENT OUTCOMES OF ACUTE APPENDICITIS AT NEKEMIT REFERRAL HOSPITAL, NEKEMITE TOWN, OROMIA, ETHIOPIA.

BY: ROCHO AYLATE (BSc)

A FINAL THESIS TO BE SUBMITTED TO JIMMA UNIVERSITY COLLEGE OF HEALTH SCIENCE IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE MASTERS DEGREE IN INTEGRATED EMERGENCY SURGERY & OBS & GYN

JULY, 2014

JIMMA –ETHIOPIA

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## ABSTRACT

**Introduction:** Appendicitis is a condition characterized by inflammation of the vermiform appendix. It is classified as a surgical emergency and many cases require removal of the inflamed appendix of either by laparotomy or laparoscopy. Untreated, mortality is high, mainly because of rupture leading to peritonitis and shock.

**Objectives:** To determine the prevalence and treatment outcome of acute appendicitis in Nekemte Referral Hospital, in Eastern zone of Wollega Oromia Region, Ethiopia from Sept 1, 2011-Sept 1, 2014 G. C

**Methods;-** A retrospective cross sectional analysis were undertaken with complete survey on 256 cases of acute appendicitis surgically managed at Nekemet Referral Hospital from Sept 1 2011- Sept 1 2014 G C. The quantitative data were entered in to statistical software version 16.0 and were cleaned, edited, the frequency distribution of variables were examined to check for data entry errors (e.g. unrecognized of missing codes, out of range values). The data were described and presented using narrative text, tables graphs and using advanced statistical analysis.

**Result:** In this study acute appendicitis accounted for 71.1% of the operations for acute abdominal emergencies and 1.5% of total hospital admissions. There were 162 male and 94 females giving a male to female ratio of 1.7:1. The mean age was  $25.6 \pm 15.2$  years (range 7-84 years). The average duration of illness at presentation and hospital stay was  $2.3 \pm 1.9$  days and  $3.4 \pm 1$  days, respectively. All the cases presented with abdominal pain and a shift of periumbilical pain to the right lower quadrant was found in the majority. Right lower quadrant tenderness was the leading physical finding. The rate simple and perforated appendicitis were 65.2% and 21.5%, respectively. 19.9% of the pts had post-operative wound infection. Out of the 256 cases operated up on acute appendicitis there was no death encountered

**Conclusion:** The study showed that the prevalence of acute appendicitis was high in Nekemte Referral Hospital, and appendectomy was the commonest surgical abdominal procedure during the period under the study. Treatment outcome were also relatively good, and the results of the study were compared with those from elsewhere.

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## **ABBREVIATIONS**

AA- Acute Appendicitis

B/n - Between

ICU- Intensive Care Unit

IEOS-Integrated emergency surgery and obstetrics

Pts-Patients

RIF - Right Iliac Fossa

RLQ – Right Lower Quadrant

TAC- Temporary Abdominal Closures

TAH- TikurAnbesa Specialized Hospital

UTI – Urinary Tract Infection

Vs- Versus

WBC- White Blood Cell

ZHD – Zonal Health Department

ZMH- Zewditu Memorial Hospital



## CHAPTER ONE

### 1. Introduction

#### 1.1. Background

Appendicitis is a condition characterized by inflammation of the vermiform appendix it is classified as a surgical emergency and many cases require removal of the inflamed appendix either by laparotomy or laparoscopy .untreated, mortality is high, mainly because of rupture leading to peritonitis and shock. (1)Reginaldfitzfittz described acute and chronic appendicitis in 1986, (2) and it has been recognized as one as the most common causes as secure acute abdomens pain worldwide correctly diagnosed on acute form of appendicitis is known as rambling appendicitis (3) With more than 250, 000 appendectomies performed annually, appendicitis is the most common abdomens surgical emergency. Peak incidence on acute appendicitis is to the second and third decades of life it is relatively rare at the extremes of ages however, perforation is more common in infancy and in the elderly, During which periods mortality rates are highest, Males and females are equally affected ,except between puberty and age 25, when males predomination a 3:2 ratio . The incidence of appendicitis has remained stable in the United States over the last 30 year, which the incidence of appendicitis is much lower in under developed countries, especially parts of Africa, and lower socioeconomic groups. The mortality rate in the United States decreased eight fold between 1941and 1970 but has remained at <1 per 100,000 since then. (4 , 5 , 6)

Appendicitis is the most common surgical cause of abdominal pain worldwide. (7, 8) Difference in incidences, sex, age, and seasonal variations have been reported widely, with paucity of information from Nigeria. The incidence is higher among the Caucasians and also in peoples living in the developed world, although this appears to be declining. (9, 10, 11, 1)

Report of increasing avoidance in African countries has been reported by some authors in the last few decades. (13, 14, 15, 16 ) Changing to western life sty1, and including diets have been held responsible for this. (17) it is generally reported to be more common in males. (1,

,12,18,19, 20, 21) and usually occurs in the age range of 10-30 years, (12, 16, 18, 19,20,21).although magnate form port- Harcourt in Nigeria , founded a significantly higher incidence in females (16).higher incidences have been reported in the summer months by many authors .(9,20,22,23). Ashley also reported an excess during spring implicating a high prevalence of viral inflammation among others during these month, (24) but sanda et al ,(25) have suggested intense challenge to the mucosa associated lymphoid tissue from allergens in the dust, during the sand storm of the spring months, the Arabian peninsula. In Nekemte referral hospital there is no study done for prevalence and magnitude of appendicitis for the aim of this study is to assess for prevalence and magnitude of acute appendicitis with age , sex, treatment out come and seasons of the year, thus ; contributing to show the burden of the disease for those who are responsible in health care service.

## **1.2. Statement of the problem**

Appendicitis is the most common surgical cause of abdominal pain worldwide (7,8)difference incidences sex , age and seasonal variations have been reported widely , with paucity information in Nigeria. The evidence is higher among the cause Caucasians also in peoples Living in the developed world, although this appears to be declining (9,10.11,12)decades of life; it is relatively rare at the extremes of age however, perforation and other complications are more common infancy and in the elderly, during which period mortality rates are highest males and females are equally affected, except between puberty and age, 25.

Reports of increasing incidence in African countries have been reported by same authors in the last few decades, (13,14,15,16) . Changing to a western life style including diets, have been held responsible for this. (17). It is generally reported to be more common in males (12,18,19,20,21) and usually occurs in the age range of 10 to 30 year (12,16,18,19,20,21).Although magnate from Portharcourt in Nigeria, found a significantly higher incidence in females (16) .higher incidences have been reported in the summer months by many authors (9 ,20 ,22 ,23). has Ashley reported an excess during spring , implementing a high prevalence of viral infections among others during these month (24) but sandaetal ,(25) have suggested data use challenge to the mucosa- associated lymphoid tissue from allergens in the dust, during the sand storm of spring months , in the Arabian peninsula .

There is debate whether emergency appendectomy {within 6 hours on admission) reduces the rises of perforation or complication versus, urgent appendectomy (greater than 6 hours after add

mission), according to a retrospective case review study (28) no significant difference in perforation rate among the two groups were noted ( $P=.397$ ). Various complications (e.g., ileus, abscess formation, re-admission) should show no significant differences ( $P= 0.667-0.999$ ). According to this study, beginning antibiotic therapy and delaying appendectomy from the middle of the night to next day does not significantly increase the risk of perforation or other complications. This finding is important not simply for the convenience of the surgical staff involved but for the fact that there have been other studies that have shown that surgical treatment during the night, when people may be more tired and there are fewer staff available, have higher rates of surgical complication. Findings at the time of surgery are less severe in typical appendicitis. With atypical histories; perforation is more common and findings suggest perforation occurs at the beginning of symptoms. Surgery may last from 30 minutes in typical appendicitis in thin patients to several hours in complicated case. Laparotomy is the traditional type surgery used for treating appendicitis. This procedure consists in the removal of infected appendix through a larger incision in the lower right area of the abdomen [32] the location in a laparotomy is usually 2-3 inches long. This type of surgery is used also for visualizing and examining structures inside the abdominal cavity and it is called exploratory laparotomy in our country over a five years period, appendectomy comprised 17.32% on emergency abdominal operation at Gondar collage of medical hospital Ethiopia. The mortality rate was 4.5% and the annual incidence was uniform (nineteen to twenty-two cases per year) (29). A Study at Yirgalem hospital (Ethiopia) showed that from Jan-1997 to December 1999 the disease accounted 27.9 % of the operations for acute abdominal emergencies and 1.1% of the total admissions (30). also in Nekemte Referral Hospital there is no any research conducted on the prevalence and magnitude of acute appendicitis . therefore the aim of this retrospective study is to assess the prevalence and magnitude of acute appendicitis with age, sex treatment outcome and other epidemiologic factors, thus contributing to show the burden of the disease for who are responsible directly or indirectly in giving health care service and also to contribute practicable recommendations based on the study findings, so that proper planning , implementation and evaluation of the perspective health activities will be conducted in the study area .

### **1.3. Significance of the study**

This study will help to indicate the prevalence and magnitude of appendicitis, treatment outcomes and also association of demographic factors with this disease in the study area, and will help for the pre-requests of master graduation. Since similar studies were not done in this health institution (Nekemte Referral Hospital) the study will provide the current prevalence and magnitude of the disease in study area. The result of the study will also help the local Health institutions: regional Hospitals Health centers, Zonal Health departments and regional Health Bureaus so that proper planning implementation and evaluation of perspective health service activities will be conducted in the area. It will also help the local health workers as baseline information to provide quality Health care service (early diagnosis and treatment) for those patients with acute appendicitis. It can also provide basic information about the prevalence, diagnosis treatment outcome of acute appendicitis that is going on similar health institutions around selected countries in the world including Ethiopia. The study will also used as aspiring board for those who need to conduct similar study in the Region and Nekemte Referral Hospital.

## CHAPTER TWO

### 2. LITERATURE REVIEW

#### **Post-operative complication after appendectomy:**

A study at Nottingham, UK in adult patients (>16 Yrs.) undergoing an emergency appendectomy at a University Teaching Hospital between Feb. 2004 and Jan.2005 were identified. A total of 199 patients with a median age of 31 years (range,16 -89 years) were identified of this 58(29%) patients experienced a postoperative complication eight (4%) patients were admitted to the surgical high dependency unit or ICU postoperatively and there was one death (0.5%). Reoperation for a postoperative complication was required in 9(4.5%) patients and there was a 13% readmission rate ( 26 patients ). comparison b/n patients with histological proven appendicitis (164 patients;82%) and those patients having a negative appendectomy (35 patients ;18%) showed no significant difference in the rate of complication as defined (43 of 164,26% Vs. 15 of 35,43 %; P= 0.08). however, patients with positive histology were more likely to experience a septic complication (29 of 164, 18% Vs1 of 35,3% p=0.028) and all reoperation come from this group despite this patients with a negative appendectomy were more likely to be readmitted (12 of 35,34% Vs. 14 of 164,8.5%;p=0.0002),predominantly with a persistent abdominal pain. It is concluded that appendectomy is associated with significant morbidity in patients with an inflamed appendix. Were more likely to experience aseptic complication but readmission was more common in pts. with a histopathologically normal appendix because of unresolved abdominal pain. (31)

#### **Natural history and management outcome of acute appendicitis in young children:**

Another study in UK, showed that during a 10 years period they operated on 816 children's with diagnosis of acute appendicitis of these, 36(4.5%) were under 5 years of age. A retrospective analysis was made of these 36 cases to assess the natural history, management and outcome in these children. Abdominal pain was the commonest symptom but was not invariable; being present in only 32 of the 36 children while vomiting was present in 28

Children Localized tenderness in the RIF was present in 21 children and generalized in 10. In 5 children there was a delay in diagnosis in excess of 18 hrs. The overall operation rate was 50% assessed macroscopically and was inversely proportional to the children's

. There was no mortality and the wound sepsis rate was 16.6%. The low incidences of acute appendicitis in very young children means that it is often overlooked 'A high index of suspicion may contribute to earlier diagnosis and thereby reduced mortality (32)

#### **Acute appendicitis in different ethnic groups:**

A study on acute appendicitis in New York 1047, USA, examines the incidence and epidemiological factors of acute appendicitis in various ethnic groups in an urban minority community. The chart of 278 consecutive patients who underwent appendectomy at the Bronx Lebanon Hospital center, Bronx, New York B/n January 1988 and December 1990 were reviewed. Thirty eight Pts who had an interval appendectomy were excluded. The remaining 239 pts. All of who had acute appendicitis, constituted the study population. The incidence of appendicitis for each ethnic group was calculated as a percentage of the total emergency surgical admissions for that group. AA constituted 3.1% of all emergency admissions to the surgical service over the period. Studied and represented 4.5% of surgical service admission from emergency department in his panics, 1.9% in Africa Americans, 1.5% in whites and 21% in Asians. This difference was significant except some comparisons involving whites. There were no significant differences in the pathological findings regarding the diseased appendix in different racial groups. This finding was statistically significant. High WBC counts indicated inflammation of the appendix, but had no predictive value, for the type of pathology. Surgical findings were similar in all groups (33)

#### **Acute appendicitis during pregnancy:**

Appendicitis complicating pregnancy studied by Mohamedian at Clarksburg WV showed that nine pregnant patients had appendectomy. Seven patients had acute appendicitis pyuria and symptoms suggesting UTI, delayed diagnosis in one whose appendix perforated. Abdominal pain and nausea with or without vomiting were presenting symptoms in all of the patients. Tenderness in the RLQ was present in sixty eight patients including two with a normal appendix, had leukocytosis with a left shift. There was no fetal or maternal loss. In addition, reviewed more than 900 other cases of appendectomy during pregnancy, as reported in the literature since 1960. Among 713 previously reported cases of confirmed appendicitis, ruptured had occurred in 25%. There were five maternal Mortality (death) ratio. Preinstall mortality was 4.8% among

Pts with acute inflammation only and 19.4%. In those with prerogative appendicitis the diagnosis rests on clinical acumen, and prompt surgical intervention in the key to good outcome. (34)

### **Complicated appendicitis related to age, sex duration of illness and clinical presentation**

Another study on acute appendicitis by lee, et al .A retrospective review of 210 consecutive cases of pediatric appendectomy and 744 adults cases for suspected acute appendicitis from January 1998 to December 2000. Pediatrics patients were defined as being 13 years and younger. Pediatric patients were similar to adult patients with respect to duration of pain before presentation (2.4± 4.3 days Vs 2.5± 7.3days ) number of patients previously evaluated (22.0 Vs 17.7 %) . number of imaging tests (CT,US;32.9 Vs 40.2%) ,and number of patients observed (16.7 Vs 17.2%) .However, pediatrics patients required less time for emergency room evaluation (4.0 ± 2.7 hours Vs 5.7±4.9 hours, P=0.0001). In children and adults, a Hx of classic, migrating pain had the highest predictive value (94.2 Vs. 89.6%) , followed by a WBC count  $\geq 12 \times 10^9/L$  (91.5Vs 84.3%) the overall negative appendectomy rate was 10.0% for children and 19.0% for adults (P= 0.003) ; the perforation rate was 19.0% and 13.8% respectively (P>0.05) . the perforation rate in children was not associated with a delay in presentation (perforated cases ,2.9 ±3.3 days, compared with non perforated cases, 2.3± 4.6 days) . mortality and morbidity including wound infection rate and intra- abdominal abscess rate were similar contrary to the traditional teaching , diagnosing acute appendicitis in children is similar to that in adults . A history of migrating pain together with physical findings and leukocytosis remain accurate diagnostic clues for children and adults .perforation rate and morbidity in children in similar to those in adults the outcomes of acute appendicitis in children are not associated with a delay in presentation or delay in diagnosis . (35)

A study on acute appendicitis at Guthrie medical center, Pennsylvania; A Starling 31% rate of perforated appendicitis in 1984 prompted a-5 year review at the Guthrie medical center. An increase over the previous rates of 13% and 0% in 1964 and 1944 was confirmed in this study. Perforation accompanied 44 of 240 cases of appendicitis (18.3%).Diagnostic accuracy in 295 cases under going operation was 81.4%. Groups at risk for perforation were patients in the 1<sup>st</sup> decade of life (34.3% with perforations) and those 50 years of age (48% perforated) perforation rates were generally inversely related to accuracy was poorest in women in the second to fourth decade or those in the mid-portion of the menstrual cycle . When the appendix was not perforated, complication occurred in 8.7% of patients while 29.5% with a perforation had complication the main hospital stay was prolonged by 2.5 days if the appendix was perforated. An increased

awareness of the risks by both the public and physicians is essential to reduce the number of perforations. {36}.

Another study a California, in 1984, 24794 appendectomy and abscess drainage procedures were performed for acute appendicitis in California hospital. Analysis of hospital discharge abstracts revealed age-and sex- specific incidence rates and in hospital case fatality rates for acute appendicitis lower than the previously reported. In persons aged 60 years and older, the fatality rate for non- perforated appendicitis with appendectomy was 0.7%and for perorating appendicitis with appendectomy and abscess 2.4%. Surgery was delayed beyond the day of admission in 21% of persons aged 40-59 years, 29% of persons aged 60-79 years and 47% of persons aged 80 years and over the proportion of cases with perforation increased from 22% to 75% b/n ages 20-80years. The population incidence of perforated appendicitis changed little after age 20 years, while the incidence of non-perforating cases declined sharply. The high proportion of appendicitis cases with perforation among the elderly may be due to the decreased incidence of non perorating appendicitis as previously proposed. Most elderly in California receive timely surgery for appendicitis and tolerate it better than previously reported. Diminished tolerance for intra-abdominal infection may be the primary determinate of the increase in case fatality with age. (37)

Similar study on appendicitis in preschool children at King Khalid university hospital, Saudi Arabia between January 2001 and December 2007, there were 66 boys and 40 girls. Sixty four children (60.3%) had complicated appendicitis, 38 (35.3% } had acute appendicitis and 4(3.7%) had normal appendix. Although classic symptoms were present in the majority of patients, atypical symptoms were found in some children. The duration of symptoms in patients with complicated appendicitis was more (5.2 Vs 2.1 days). A diagnosis other than appendicitis was suspected in 47 patients (73.4%). Sixty (56.6%) patients had peroration at the time of surgery. complicated appendicitis was associated with a longer hospital stay and more post-operative complications.(38)

A study by department of surgery at turkey shows that acute appendicitis, the most common cause of surgical emergency, shows different pathogenesis clinical courses and outcome in the elderly. In this study operative and hospital records of patients with appendicitis were retrospectively reviewed Patients who were 50 years of age or older were the main constituents of the study. Demographic features, preoperative clinically diagnosis abdominal interventions and



postoperative morbidity and mortality were analyzed as the main criteria. A total of 109 older patients constituted 4.3%, of appendectomy cases. Besides RLQ transverse incisions, surgery was performed via vertical incision in 2.8% of cases with a diagnosis of acute abdomen in the elderly the perforation rate was significantly higher than in pediatrics and adults ( $P < 0.001$ ) – the proportion of the elderly among perforated cases was significantly increased when compared to non perforated cases (12.9 Vs 2.9%:  $P < 0.0001$ ). post-operative morbidity was noted in 35.8% of elderly patients , in 73.8 % of perforated , and in 11.9% non- perforated cases (  $P < 0.0001$ ) the mortality rate was 5.5% in the elderly group, 11.9% in patients with perforated and 1.5% in patients with non- perforated appendicitis . No mortality was noted in patients younger than 50 years. The precise diagnosis of appendicitis is relatively low in the elderly. Despite the uncommon occurrence of appendicitis, the perforation rate is still unfavorable. Post-operative morbidity and mortality is unacceptably high .adversely affects clinical diagnosis, the stage of decrease and the outcome of patients. (39)

Another similar study at New Delhi, India , A total of 348 cause punitive appendices removed between of clinical suspicion of acute appendicitis were selected . the male to female ratio 2.6:1 with highest number of cases in the age group 21-30 years;282 specimens out of 348 showed that features consistent with acute appendicitis with an overall higher occurrence in male statistically significant association was obtained b/n perforation and male sex, older age, and acute supportive appendicitis. (40) A study to analyze clinical, paraclinical and of acute appendicitis therapeutic aspects of cases at national university hospital at Bangui in central African Republic, from September 15,1990 to February 15,1992,285 patients under went laparotomy to treat acute appendicitis- carried out a study of clinical and there therapeutic aspects of 57 patients with complete case histories (20% of patients undergoing surgery).

The appendices were sent to laboratory of pathological anatomy of the faculty of medicine at Marseille France, for analysis. The frequency of appendectomy among patients undergoing visceral surgery by laparotomy with no acute traumatic abdominal syndrome was 42.3 % the incidence of appendectomy for city of Bangui in 1991 was 36.5% per100, 000 inhabitants.

These cases of appendicitis were diagnosed essentially on clinical grounds, Leukocyte count exceeded  $10,000 \text{ per mm}^3$  in 30% of patients, these to histological examinations revealed the present of parasites in 10 cases. The frequency of appendectomy on principle was 12.7% and parental treatment was prescribed systematically following surgery the mean duration of hospital

stay was 6.7 days. No early post-operative complications resulting the death of the patient were observed; however, two late post-operative complications resulting in the death in the patients were observed, giving a mortality rate of 3.5%. These complications were one case of peritonitis and one case of Occlusive syndrome with septic shock. (41) A prospective audit from September 2010 to September 2011 at Endale hospital in South Africa showed that a total of 200 patients with a provisional diagnosis of acute appendicitis were operated on at endale hospital. There were 128 male (64%) in this cohort,. The mean duration of illness prior to seeking medical intervention was 3.7 days. Surgical access was by a midline laparotomy in 62.5% and by a Lanzes incision in 35.5%, Two percent of patients underwent a laparoscopic appendectomy. The operative findings were as follows; macroscopic inflammation of the appendix without perforation in 35.5% (71/200) and perforation the appendix in 57% (114/200). Of the perforated appendices, 44% (51/114) were associated with localized intra- abdominal contamination and 55% (63/114) had generalized four-quadrant soiling. Thirty percent (60/200) required TAC with planned repeat operation. , major complication includes hospital acquired pneumonia in 12.5% (25/200), wound dehiscence in 7% (14/200), and renal failure in 3% (6/200). Post operatively 89.5 (179/200) were admitted directly to the general ward, while 11% (21/200) required admission to the ICU. The overall mortality was 2% (4/200). In the study the incidence of acute appendicitis among African patients seems to be increasing. (42)

Another prospective study at Nigeria (Lagos), 250 cases of acute appendicitis was performed to critically analyze the patterns of presentations, management, operative finding and treatment out comes. There were 133 male 117 females giving a male to female ratio of 1.2:1 the mean age was  $25.7 \pm 10.5$  years with the majority of cases (42.8%) occurring in the third decades of life , abdominal pain (100%), fever (48.4%) , vomiting (47.8%) were the commonest symptoms . commonly elicited signs include RIF direct tenderness (direct)74.4%) Rebound tenderness (59.2%). localized tenderness (59.2%), localized Guarding (42.8%), and right tenderness (43.2%). The mean WBC count was significantly elevated (mean  $8\ 538 \pm 4166$  per  $\text{mm}^3$ ,  $P > 0.05$ ). 63% (156/245) of all appendices were retrocecal in position. Two hundred and forty-five patients (98%) with a diagnosis of acute appendicitis had appendectomy. The commonest post-operative complication was wound infection (8%), over all complication rate was 13.5% and negative appendectomy rate was 13.4. A retrospective 7years study at Kumasi Ghana, b/n January 1988 and December 2004, six hundred and thirty eight patients were studied. There were 408 men 230

women; a male to female ratio of 1.7:1. The mean age was  $32.4 \pm 15.0$  ,SD years. All patients were admitted with abdominal pain that were initially located at the umbilicus in 38.0% and diffused in 31.8%. Vomiting 85.7% fever 73.0% and anorexia 49% were the most frequent associated symptoms. The mean duration of illness was 74 hours. RIF pain and tenderness were present in 612 patients (89.22%) . the total WBC count was significantly raised ( $P=0.05$ ). six hundred and thirty eight appendectomy were performed. 39% (249/ 638) of appendices were perforated at operation and 25.9%(249/638) of appendices they were perforated at operation and 25.9%(56/216) of the removed had no histological evidences of inflammation . The complication rate was 43.1% and wound infection (41.5%) was the most common. the average stay in hospital was 7 days. there were 12 deaths a mortality rate of 1.9% mostly elderly patients .(44

Another similar study at Nigeria in 5 years period investigating acute appendicitis 603 consecutive patients with the disease were studied in detail of this number 388(64.3%) were females and 215(35.7%) male giving female ; male ratio of 1.8:1. The patients were aged 4-65 years with a median age 22.1 years; females with a median age of 25.4 years. patients presented to hospital late ;3-5 days (median days ) from the onset of symptoms, the strikingly most common of these was abdominal pain seen in all patients, and tenderness , local or with rebound was uniformly elicited . Supportive lab and radiological service were not regularly available; however, when WBC count was obtainable Leukocytosis with left shift was a useful finding. At Operating 422(70%) patients had on acutely inflamed appendix, 121(20%) gangrenous or Perforated appendicitis and 18(3%) an appendix abscess:, appendix mass was palpable in 42(7%) patients and those were treated conservatively. Wound infection complicated surgery in 18(3%) patients; there were no operative deaths. Acute appendicitis was the 2<sup>nd</sup> most commonest surgical abdominal emergency during the period under study. (45) In our country (Ethiopia), a total of 277 cases of acute appendicitis admitted from January 1<sup>st</sup> to December 31<sup>st</sup> 1998 at Zewiditu memorial hospital (ZMM) were reviewed. 16(5.8%) had presented with a RLQ mass, which was managed conservatively while 261 (94.2%) had emergency surgery. At Operation, it was found that 184 (70.6%) had simple appendicitis, 45 (17.4%) had perforated, and 25(9.5%) gangrenous appendices. Seven (2.5%) had appendicular abscess with amputated stump left. The male to female ratio was 2.6:1. The patient's age ranged b/n 13 and 75 with the peak occurring b/n 13-30 years. The most common symptoms were abdominal pain, (100%) and Vomiting (76.9%) the

commonest signs were localized tenderness in the RLQ ( 92.4%) with rebound tenderness (70.4%) Digital rectal, examination was done in 127 patients in whom tenderness was elicited in 80 (63%). of them the approach to the appendix in 78.4% of operation was. thorough a transverse incision at Mc Burney's point .In ZMH, appendectomy was found to be the most commonest emergency operations. Accounting for 46.7% of cases and carried a post -operative mortality rate of 1.2 %.( 46)

Similar study at TikurAnbesa specialized hospital between the year 1999 to2000, A total of 147 children's under the age of 13 years admitted for acute appendicitis were analyzed. The mean age was 9.3 years, and appendicitis occurred more commonly among males. factors independently found to be predictors of perforation by univariate analysis were; age <10years ,duration of illness for over 24 hours, history of treatments elsewhere before arrival to TAH, generalized abdominal tenderness and or rigidity , hypoactive and or absent bowel sound, RLQ mass, Leukocytosis with neutrophilia and presence of complications . However, none of was retained as significant factors in multiple logistic regression analysis. It is concluded that there are many factors that are associated with perforation but there is no single factor that independently predicted perforation of appendicitis. Delay in intervention due to late presentation to hospital is an important preventable factor. (47)

A retrospective study that was done on 200 cases of acute appendicitis surgically managed at yirgalem hospital from January 1997 to December 1999. During this period the disease accounted for 27.9% of the operation for acute abdominal emergencies, and for hospital admissions there were 159 male and 41 females giving a male to female ratio of 3.9:1. The mean duration of illness at presentation and hospital stay were  $3.4 \pm 1.7$  and  $7.1 \pm 5.3$  days, respectively. All the cases presented with abdominal pain & a shift to the periumblical abdominal pain to the RLQ was found in the majority. RLQ tenderness was the leading physical finding. The rate of simple and perforated appendicitis was 45.5% and 44% respectively. Thirty two percent of the patients had post -operative wound infection , out of 200 patients operated up on for acute appendicitis 8(4%) died. (30)

## **Chapter Three**

### **3. OBJECTIVES**

#### 3.1. General objective

To determine the prevalence and treatment out comes of acute appendicitis in those patients who undergo appendectomy in Nekemte Referral Hospital in the study period from Sept1 , 2011 – Sept1 ,2014 G C .

#### 3.2. Specific objectives

- ❖ To determine the prevalence of acute appendicitis
- ❖ To determine the prevalence of treatment outcome
- ❖ To identify factors affecting treatment out come at different age groups

## CHAPTER FOUR

### 4. METHODS AND MATERIALS

#### 4.1. Study Area and Study Period

The study was conducted in Nekemte referral hospital. Nekemte referral Hospital was found in Nekemte town 331 km. from the capital Addis Ababa to the west .The hospital was serving for a total population of about 2.1 million peoples of Nekemte town, East wollega zone, parts of west wollega zone, Horoguduru zone and west shoa zone .Currently Nekemte Referral hospital had 178 beds used for the inpatient services, as to the human resource there were total number of workers [113 health professionals and 78 administrative staffs].

The Hospital provides Medical treatment, ophthalmic treatment, Phsyatric treatment, major and minor operation, inpatient services, MCH, control of HIV, laboratory, X-ray and ultrasound, drug and pharmacy, training services and physiotherapy.(HMIS department of the hospital)The study would be conducted from September 1 , 2011 to September 1 ,2014 G C.

#### 4.2. Study design

Facility based retrospective cross sectional study on the records in all patients who had appendectomy at Nekemte Referral Hospital in the study period were conducted.

#### 4.3. Populations

##### 4.3.1. Source of population

All patients who have surgical intervention in Nekemte Referral hospital in the study period

##### 4.3.2. Study population

All population in the study area who have potential risk to develop acute appendicitis in NekemteReferral Hospital from Sept1 , 2011- Sept 1, 2014 G . C.

#### 4.3.3. Sample size

The sample size would include all patients who had appendectomy at Nekemte Referral Hospital during the study period Sept 1 2011-Sept 1, 2014 G.C.

#### 4.4. Sampling technique

Census of all patients who had surgical intervention in the study at Nekemte Referral Hospital The total number of patient who had surgical interventions in the hospital was retrieved through review of books were used to review diagnosis of appendicitis, surgical intervention, and treatment outcome during surgical registration books during the study years .Patients cards and operating room registration a period from September 1 2011 to 2014 G .C was included

#### 4.5. Inclusion & Exclusion Criteria

Who have gotten operative management for acute appendicitis at Nekemte Referral Hospital were included in the study. All records of patients, who have undergone appendectomy of a normal appendix having an initial Patients different diagnosis other than an acute appendicitis, were excluded from the study.

#### 4.6. Measurements

##### 4.6.1. Variables

##### Independent variable

- Age
- Sex
- Address
- Ethnicity
- Type of abdominal incision
- Duration of illness
- Duration of Hospital stay
- Signs and symptoms
- Post-operative complication

##### Dependent variables

- Outcome of appendicitis

#### 4.7. Operational Definition

- ❖ Typical Appendicitis: related medical history was defined as abdominal pain which progressed from area to the RLQ and which was followed by either anorexia, nausea per-umbilical or vomiting.
- ❖ Atypical Appendicitis: related medical history was defined as sudden, non-progressive abdominal pain, vague or absent pain localization, or predominant symptoms of diarrhea or vomiting
- ❖ Leukocytosis: laboratory finding of  $WBC >10,000/mm^3$
- ❖ Laparotomy: is a surgical procedure involving an incision through the abdominal wall to gain access in to the abdominal cavity has many types listed thesis questioner.
- ❖ Appendicitis : is an inflammation of the appendix, which is the worm-shaped pouch attached to the cecum, the beginning of the large intestine
- ❖ Appendectomy : surgical removal of appendix for those of the organ, with A.A
- ❖ Gangrenous Appendicitis: complicated by gangrene of the organ, due to interference of blood supply
- ❖ Good outcome: patients improved and discharged develop no post-operative complication.
- ❖ Bad outcome patients improved but develop one or more post-operative complication or patients dead after post-operative management.
- ❖ Post-operative wound infection: .infection in the tissues of the incision and operation area
- ❖ Outcome; Condition of the patient at discharge either improved and no operative complication or improved but developed one or more complications or dead

#### 4.8. Data collection instrument and data collection procedures

Data collection tools would be adopted from similar studies. Those tools include a special patient Performa which includes socio demographic characteristics, signs and symptoms, physical findings, out comes, complications encountered, and another relevant items related to disease . The questioner would be documented from each patient card and surgery registration books. Finally, summarized, analyzed and interpreted and edited.



#### 4.9. Data collection

Data would be collected by structured questionnaires which would be filled by two trained IEOS intern directly from operation room records patient charts .The total numbers of appendectomy in the Hospital would be retrieved through review of surgery registration book during the study period .Patient cards and operating room registration books would be used to review diagnosis of appendicitis ,surgical intervention and treatment outcome during a period from September 1 2011 to September 2014 G.C would be included .

#### 4.10. Data processing and analysis

The quantitative data would be entered in to statistical software version 16.0 and would be cleaned, edited, the frequency distribution of variables would be examined to check for data entry errors (e.g. unrecognized or missing codes, out of range values) . The data would be described and presented using narrative text, tables graph and using chi-square to know association between variables and regression analysis .

#### 4.11. Data quality assurance

The following measures were undertaken so as to control the quality of the data

- The data collectors would be trained for three days
- Before data collection started patients cards and surgery registration books would be collected and cross matched
- The questionnaires would be checked to avoid printing errors before data collection started
- The name of the data collectors would be recorded so as to enhance the responsibility to
- An incomplete data.
- Data collected would be reported to supervisor in daily basis and the supervisors checked the completeness of the data code cleaning would be done.

#### 4.12. Ethical clearance

An official letter would be obtained from the department of integrated emergency Obstetrics & Gynecology and General surgery, College of medicine and public Health science ,Jimma university and submitted to Nekemte Referral Hospital .Confidentiality of the data would be maintained and respected .Ethical clearance would be obtained from Jimma University ethics review board

#### 4.13. Data quality

Data collectors and the data collected would be closely supervised by the principal investigator and checked for completeness and consistency at the site of data collection. The overall study would be checked by advisors (public health and clinical advisors), for its validity and success fully completeness of the project

#### 4.14. Plan for utilization and dissemination of result

The study result would be communicated to different stake holders in different formats including face to face presentation of the study findings in a peer reviewed and presentation in scientific Meetings would be also being considered.

## CHAPTER FIVE

### 5. RESULTS

#### 5.1. Patterns of socio-demographic and prevalence

A total of 16991 patients were admitted to Nekemt Referral Hospital, account of this 2725 cases were admitted to the surgical side of the hospital during the study period of them 360 cases were operated up on for acute abdominal emergencies. Two hundred fifty six of the cases were acute appendicitis accounting for 71.1% of the abdominal emergency operations and 1.5% of total hospital admissions. There were 162 (63.3%) males and 94 (36.7%) female giving male to female ratio of 1.7:1. Seventy two point seven percent (186 cases) of the cases were either urban dwellers while the remaining 27.9% (70 cases) were from rural areas. One hundred and twenty eighty of cases (50%) were single while the remaining one hundred and twenty eight (50.0) are married, and most of them are from Oromo ethnic group about two hundred eight (81.25 %). Two hundred and thirty nine (93.4%) Protestant religion followers from these 155 cases were males & 84 cases were females, while the rest 17 (6.6%) are muslims from these 7 cases were males & 10 cases were females.

The mean age was 27.6+\_15.2 years (range 7-84 years), The age category include 0-14(17.18%), 15-29(49.6%), 30-44 (20.7%) 45-59(7%) >60(5.8%) most of the cases 127 cases (49.6%) were in the age group of 15-29 years. The annual incidence of the disease were almost uniform (about 85 cases per year) during the study period. Forty four (17.2%) of the cases were in the pediatric age groups (0-14 years). Age and sex distribution of patients is shown in figure:1

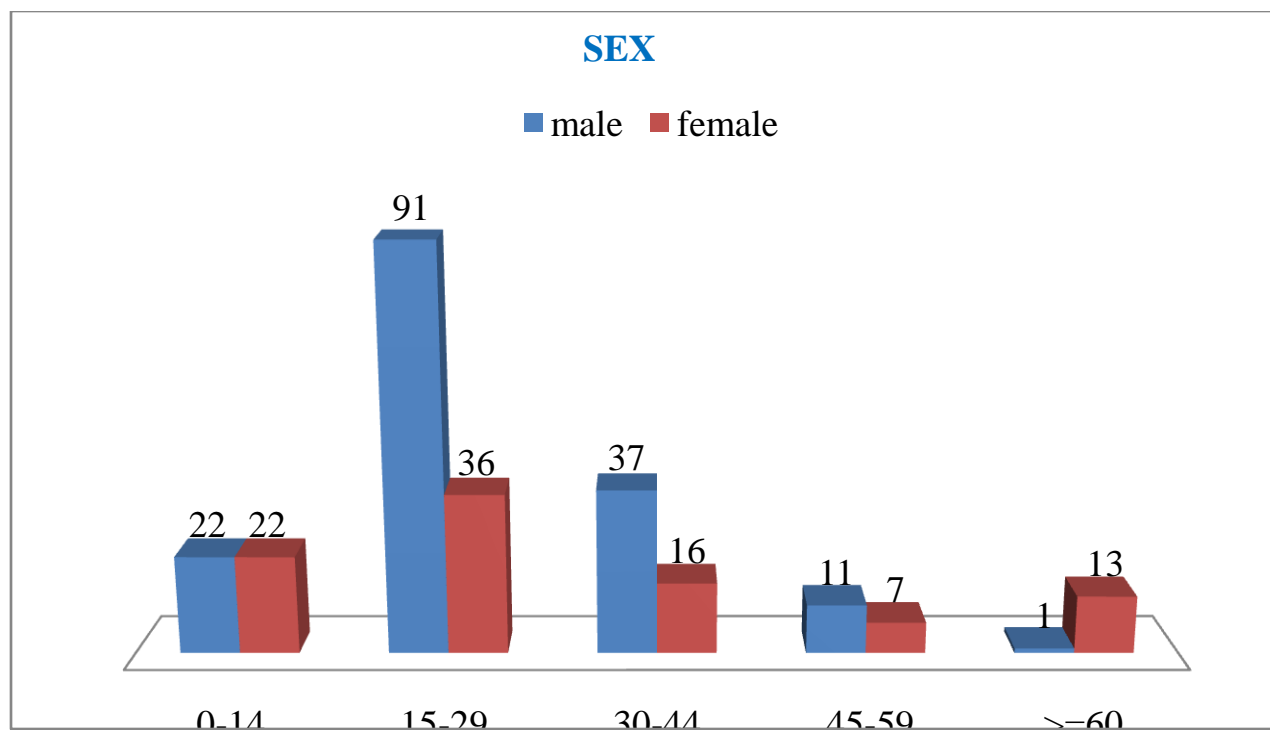


Fig1. Age and sex distribution of patients with acute appendicitis operated at Nekemt Referral hospital, from September1 2011-september1 2014 G.C

#### 5.2. Duration of illness at presentation:

The average duration of illness at presentation was  $2.3 \pm 1.9$  days with the range of 1-11 days.

Table: 1 Frequency distribution shows duration of illness for acute appendicitis at Nekemte Referral Hospital from Sept 1 2011-Sept 1 2014 G C,

Duration of illness	No of patients	%
<24hrs	<b>149</b>	<b>58,2</b>
24-48hrs	<b>91</b>	<b>35,5</b>
>48hrs	<b>16</b>	<b>6,2</b>
Total	<b>256</b>	<b>100</b>

### 5.3. Patterns of clinical symptoms and signs

All of the patients had abdominal pain and a shift of pain to the right lower quadrant was found in 226 (88.3%) of the cases. Vomiting was found 197 (77 %) and the second common presenting symptom followed by fever (56%).

The leading physical finding was right lower quadrant tenderness 240 cases (86.3%).the rest 39(14.8%) of the patients had generalized abdominal pain 14(8.8%) RLQ mass.

Those patients WBC count was obtainable 162 cases(64.45%) >10,000 cell indicated inflammation of appendix but had not predictive value of the types pathology.

Table 2: symptoms and signs in 256 patients with acute appendicitis operated at Nekemte Referral Hospital Sept1 2011- Sept 12014 G.C

Clinical pictures	No of patients	%
<b>Symptoms</b>		
➤ Abdominal pain	256	100
➤ Vomiting	197	77
➤ Fever	148	57.8
➤ Constipation	41	16
➤ diarrhea	19	7.4
<b>Signs</b>		
➤ RLQ tenderness	240	93
➤ Generalized tenderness	38	14.8
➤ RLQ mass	21	8.2

### 5.4. Patterns of intraoperative finding and management outcome

With regarding the intra operative findings simple 167cases (65.2 %) gangrenous 13 cases(5%) perforated 55 cases(21.5 %) with abscess 21cases (8.2%) appendicitis was found of the patients respectively but the rate of perforation in pediatrics age group was found to be high 18 cases out of44 cases (40.9%) followed by those age >60yaers4/15 cases (26.6%) .

Table: 3 frequency distribution of intra operative finding of 256 patients with acute appendicitis at Nekemte Referral hospital September 1 2011- September 2014 G .C.

Appendicitis	No of patients	Percent
Simple	167	65.2
Gangrenous	13	5.0
Perforated	55	21.5
With abscess	21	8.2
Total	256	100

Table: 4 Intraoperative findings and age ranges of 256 patients with acute appendicitis at Nekemte Referral Hospital, Sept1 2011-Sept1 2014 G.C

Age Group	Operative finding				
	Simple	gangrenous	Perforated	With abscess	Total
0-14	18	5	18	3	44
15-29	96	2	25	6	129
30-44	38	3	5	7	53
45-59	8	2	5	3	21
≥60	7	1	4	2	15
Total	167	13	55	21	256

#### 5.5. Post- operative complication :

One hundred and eighty one( ) cases of the patients had good outcome where they have improved and discharged from the hospital without complication. But some of them about 75 cases(29.3% ) have develop bad outcome where they have improved but develop one or more complication. The wound infection was the predominant 51 cases (19.9% ) followed by pneumonia 8.6% (22case) others 2 cases( ,7%) and the duration of hospital stay in these patients were >7days. There were no deaths encountered.

Table: 5. Frequency distribution Of Patients post- operative complication for acute appendicitis at Nekemte Referral Hospital from Sept 1 2011-Sept 1 2014 G.C

Types of post op complication	NO Patients	%
Wound infection	51	19.9
Pneumonia	22	8.8
Others	2	.7
Not complicated	181	70.7
<b>Total</b>	<b>256</b>	<b>100</b>

#### 5.6. Duration of Hospital stay:

Hospital stay ranged from 3-9 days with average length of 3.4+1days

Table: 6 Shows duration of Hospital stay of patients operated for acute appendicitis at Nekemte Referral Hospital from Sept 1 2011-Sept 2814 G C.

3-4days	130	50.7
5-7day	<b>104</b>	<b>40.6</b>
>7days	<b>22</b>	<b>8.6</b>
Total		

#### 5.7. Association of determinant variables and management outcome of acute appendicitis

To identify the factors associated with management outcome of acute appendicitis by a binary logistic regression was performed on a dichotomous dependent variable. Therefore; variables with P-value of  $\leq .05$  like, Age sex marital status ethnicity residency duration of illness and duration of hospital stay were selected as candidates and entered multiple logistic regression analysis at preliminary binary logistic regression analysis

Table: 7, Measurements of factors associated with different variables and outcome of patients operated for acute appendicitis in NEkemte Referral Hospital from Sept 1 2011-Sept 1 2014 GC.

Variables	Labels	Outcome		COR at 95%CI	P-Value	AOR at 95%CI	P- Value
		Good	Bad				
<b>Residency</b>	Urban	139(54.28%)	47(18.35%)	1.447(.769,2.633)	.226	.254( .062-1 045)	.
	Rural	45(17.57%)	25(.76%)	1	1	1	1
<b>Sex</b>	Male	126(49.21%)	36(14%)	.504(.288 , .883)	.017		.058
	Female	60(23.04%)	34(13.3%)	1	1	1	1
<b>Ethnicity</b>	Oromo	163(63.67%)	41(16%)	5.273(2.749 , 10.113)	.000	6.587(1.960-22.137)	.002
	Amahara	22(8.59%)	29(11.32%)	1	1	1	1
<b>Marital status</b>	Married	103(39.23%)	24(9.37%)	.411 (.232 , .720)	.002	2.067(.845-5.045)	.112
	unmarried	67(20.17%)	46(17.96%)	1	1	1	1
<b>Duration of presentation</b>	<24	111(43.35%)	38(14.84%)	.432(.120-.975)	.045	2.046(.587_8.225)	.313
	24-48	67(26.17%)	24(9.37%)	.358(.121 , 2.060)	.064	_	.325
	>48	8(3.12%)	8(3.12%)	1	1	1	.1
<b>Age</b>	0-14	18(7.05%)	26(10.15%)	.860(.058_1.94)	.000	.527(156_.1776)	.301
	15-29	18(7.03%)	26(10.15%)	.086(.038-.194)	.000	5.786(1_33.488)	.050
	30-44	113(44.14%)	14(5.46%)	.249(.106-.585)	.001	20.246(2.478_165.407)	.005
	45-59	39(15.23%)	14(5.46%)	.692(.280-.2.084)	.513	23.875(2.234_255.168)	.009



	>60	9(3.51%)	9(3.51%)	1	1.	1	.1
<b>Duration of hospital stay</b>	3-4days	97(37.89%)	33(12.89%)	3.472(.754_15.343)	..111	1.310(.677_2.807)	.487
	5-7days	69(26.95%)	35(13.67%)	5.072(1.121_22.947)	.035	.387(.067_2.237)	.289
	>7days	20(7.81%)	2(.78%)	1	1	<i>1</i>	.1

### **Predictors of management outcomes of acute appendicitis**

Most of the determinant variables that predicts negative or positive management outcome of patients were found to be associated statistically in bivariate analysis.

Then from this analysis, age of patients has statistically significant association with risk factors of (AOR=20.246, 95% CI: 2.278-165.407 P-value=<0.005). Those patients whose ages <30 years were 20.246 times more likely to have affected when compared with patients older than 30 years of age.

Sex also has significant association statistically with management outcome (COR= .504 95% CI: .288-.888 P- value=0.017), showing that males were .496 more likely to develop bad management outcome in relative to the outcome of females.

Duration of presentation to hospital after illness >24hrs and duration of hospital stay > 7 days are determinant factor for management outcome that are found to have statistically significant association (COR=.342 95% CI: .120 , .975 and COR 5. 072 95% CI =1.121 -22.947showing that >24hrs .342 and >7days 5.072 times more likely to develop unfavorable management outcome respectively .

Marital status and ethnicity are determinant factors for management outcome that are found to have statistically significant association with (COR .411 95% CI .232- .729 of PV=.002 and COR 5.27 at 95% CI 2.749-10.118) , showing that being married .411 times than unmarried and being Oromo 5.273 times than Amhara ethnicity to develop unfavorable management outcome respectively.

## CHAPTER SIX

### 6. DISCUSSION

Acute appendicitis is common in the western world but rare in Africans (3, 4, 5). The high prevalence of appendicitis in my series is in agreement with other African studies (11, 13). Two hundred and fifty six cases of appendicitis were seen over a three-years-period in the present study. Grest reported 278 cases of appendicitis over a 3 years period (33) and Ricci MA et al reported 240 cases over a 5 years period (36). Two hundred and ten cases of childhood appendicitis were seen over a five-years period by lee et al (35) and 277 cases were seen over a five-year-period by Bexege et al (46). Appendicitis was responsible for 71.1% of emergency abdominal operations in the present series and study from Yirgalem Hospital showed this to be 27.9% (30). Therefore in the present study appendectomy were the top emergency surgical procedures. Many of the cases with appendicitis were from urban areas which was also shown in similar studies from Ethiopia (30, 29) and Bangui in Central African Republic (41).

The majority of cases in my series were from protestant religion followers 93.4 % and Oromo ethnic 81.25% and marital status 50% of them are married and 50% are single which did have stastically significant association with the disease under study. The majority of patients were in the age group between 15 and 29 years. Most of the patients in the Grest's study were in the age group between 11 and 30 years (33). The peak age in Ricce's study was between 15 and 30 years (36). The second decade was the peak age from study in Bangui (41). Male predominance was found in the present study (male to female ratio = 1.7:1). The male to female ratio of 1.7:1, 1.8:1, 2.6:1, 3.9:1 were shown in the studies by Yebouhry et al, Otu, Bexege and Assefa respectively (44, 45, 46, 30). But Otu in one study showed a male to female ratio of 1:1.8 (6). The youngest patient in my series was 7 years old. Otu, Ahmed and Abila reported age range 4-73 years, 4-60years and 4-51 years respectively. The prevalence of acute appendicitis was very low during infancy and childhood (45, 25). But absence of a single case below the age of 7 in this series may be due to misdiagnosis. All the cases with appendicitis presented with abdominal pain similar to

other studies. (6, 11, 20, 27, 28). Ninety eight percent of children in Johnson's series had abdominal pain at presentation (19). A shift of periumbilical abdominal pain to the right lower quadrant was encountered in 88.3% of cases, comparable to the study from Gondar (87.5%) (29). Vomiting was found in 77% of patients. Eighty-two percent of patient had vomiting in a study from Addis Ababa (30) in Ghana study vomiting was found in 85.7% of patients (44). The finding of localized tenderness in the right lower quadrant was not different from that of Gondar study 94.2% (29). Perforation was found in 21% of the cases which was comparable to the study from Medunsa, South Africa (25%), Ibadan (9.3%) and Nazareth (25%) (22, 27, 29) but this is low when compared to studies from Natal university, South Africa (43%), Uganda (37%) and Gondar (45%) (7, 13, 29). Perforation in the peridiatric age group was 41%; perforation rate different from Kenia (52.9%) (12) but there were also reports from Ethio-Swedish hospital in Adis Ababa and Gondar (i.e 67% and 54%, 38.5% respectively) (14, 19, 29 ). Wound infection rate of 19.9% was found in the present study comparable to study by Fashina from Nigeria (8%) (43) but Ochola and Kotiso et al reported wound infection rates of 35% and 41% respectively (12, 20). Pneumonia was found in 8.6% of post- operative patients in my series. Ahmed reported that 12.5% of patient developed hospital acquired pneumonia (31%). For those patients WBC counts were obtainable (165 cases); high counts indicated that inflammation of the appendix but had no predictive value for the type of pathology. This is similar with the study done by Grest from New York (33). There was no death encountered in my series comparable to the studies by Otu (0%) and Ahmed (0%) (45). Kortiso et al showed a mortality rate of 4.5% which is currently unacceptable. In all cases surgery was done at the day of admission and surgical access was through a transverse incision at Mcburney's point in 81% of cases.

## CHAPTER SEVEN

### 7. CONCLUSION AND RECOMMENDATION

#### 7.1. Conclusions

Majority of patients with acute appendicitis were in the second decades of life .

Males are more affected.

Almost two-thirds of the patients presented lately after 24 hours of onset of their illness.

Abdominal pain is the main presenting complaint.

Late presentation and being young age are associated with gangrenous appendicitis, appendiceal perforation, and appendiceal abscess formation

The mortality rate was nil in this series.

The treatment outcome of acute appendicitis was almost good relative to study done elsewhere

The prevalence of acute appendicitis was high in the study period

In the study period there was no case of acute appendicitis less than seven year

#### 7.2. Recommendation

When patients who are in their second decades of life present with abdominal pain, they need to be assessed thoroughly for acute appendicitis.

The treating clinicians need to have high index of suspicion of acute appendicitis for male patients

Relevant laboratory investigations need to be sought during evaluate the patients

The clinicians need to record all the intraoperative findings on medical charts of the patients relevant information should be recorded

## ANNEX

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## QUESTIONERS

This is special patient Performa to be filled by trained data collectors from patients card, operation note registration books; that contains details on patient demographics, clinical features, supportive diagnostic tools, operative findings and out comes, of those patients undergoing appendectomy at Nekemte Referral hospital from September 1 2011 to Sep 1 2014 G .C.

### 1.1 BACKBRAUND IN FORMATIONS

01- Hospital card number

02-sex

1. Male  2. Female

03 Age -----

04. Address

1. Town

2. Rural

05. Education status

1. Litrate

2. Ilitrate

06. Marital status

1. Married  3. Widowed  5. Other /specify \_\_\_\_

2. Unmarried  4.Divorced

07. Religion

1. Orthodox  3. catholic  5 others specify-----

2. Muslim

4 ; protestant

0 8 Ethnicity

1. Oromo 2, A  a 3 , Others specify

### 1.2 Specific information

01. Duration of illness before Nekente Referral hospital

1. <25hrs 2. 24-48hrs 3. >4hrs



02 Time gap between admission and operations performed

1 <24hrs days  2. 24-48hrs  48hrs

03 Duration of hospital stays

- 1. 3-4days
- 2. 5-7days
- 3. >7days

04. Symptoms

- 1. Abdominal pain (Peri -umbilical)
- 2. Vomiting
- 3. Anorexia
- 4. Nausea
- 5. Diarrhea
- 6. Constipation
- 7. Dysuria
- 8. Hematuria
- 9. Worms (vomiting or stool)
- 10. mass in abdomen

05 signs

- 1. Generalized abdominal tenderness
- 2. localized tenderness over the right iliac fossa \_\_\_\_\_
- 3. Fever >37.0c

06, peritonitis

- . Localized
- . Generalized

07. Right iliac fossa mass

08 Type of incision (laparotomy)

- 1. Grid iron Incision
- 2. Lanz incision (Rocky Davis)
- 3. Sub umbilical midline incision
- 4. Long midline Incision
- 5. Gridiron + sub umbilical mid line
- 6. Lanz + sub umbilical

09 operative findings

- 1. Normal appendix /Negative
- 2. Inflamed appendix

3. Perforated

4. Gangrenous

5. Grossly normal

With other pathology

Without other pathology

36. Fecolith

10. Complications

1. Wound sepsis

4. chest infection

2. Post-operative ileus (prolonged)

5. Iatrogenic small bowel injury

3. Peritonitis

6. Wound dehiscence

3.1 intra peritoneal abscess

7. Retro peritoneal necrotizing  fasciitis

3.2 compartment syndrome

8. Faecal fistula

9. Death

11. Supportive lab investigation

1. WBC count. Write the number \_\_\_\_\_

2. U/S

3. X-ray

4. C-reactive protein

5. X-ray