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Prevalence of Cholecystectomy Complications and Patient Characterstics Operated in Tibebe Ghion Teaching Specialized Hospital, North West Ethiopa

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BAHIR DAR UNIVERSITY COLLEGE OF MEDICINE AND HEALTH SCIENCES
DEPARTMENT OF Surgery

Prevalence of Cholecystectomy Complications and Patient Characteristics Operated in Tibebe
Ghion Teaching Specialized Hospital, North West Ethiopia

By- Nebiat Embiale (MD, SURGERY RESIDENT)

A RESEARCH THESIS SUBMITTED TO DEPARTMENT OF SURGERY, SCHOOL OF
MEDICINE, COLLEGE OF MEDICINE AND HEALTH SCIENCES IN PARTIAL
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DEPARTMENT OF SURGERY

Approval of Dissertation/thesis for defense result

We hereby certify that we have examined this dissertation/thesis entitled PREVALENCE OF CHOLECYSTECTOMY COMPLICATIONS AND PATIENT CHARACTERISTICS OPERATED IN TIBEBE GHION TEACHING SPECIALIZED HOSPITAL cross-sectional study by Nebiat Embiale. We recommend and approve the dissertation/thesis.

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BAHIR DAR UNIVERSITY COLLEGE OF MEDICINE AND HEALTH SCIENCES
DEPARTMENT OF SURGERY

PREVALENCE OF CHOLECYSTECTOMY COMPLICATIONS AND PATIENT
CHARACTERISTICS OPERATED IN TIBEBE GHION TEACHING SPECIALIZED
HOSPITAL, NORTH WEST ETHIOPA

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Abstract

Introduction

Gallstone is the formation of stone in the gall bladder lumen. Gallstone is one of the most common digestive surgical disorders worldwide. More than 95% of biliary tract affections are due to gallstone disease. Among biliary tract diseases, cholelithiasis is the leading cause of inpatient admissions for gastrointestinal problems. A primary symptom of gallstones is repeated attacks of pain, often referred to as biliary colic.

The management of patients with symptomatic cholelithiasis or for those patients who develop complications from gall bladder stone is surgery. Globally around 90% of cholecystectomy is done laparoscopically

Objective: The purpose of study was to assess the different means of cholecystectomy and its short-term surgical outcomes of cholecystectomies done in Tibebe Ghion Specialized Hospital in two years period 2019-2020.

Method: The study was cross sectional retrospective chart review study. Patients with gall stone disease and operated in the study period was included in the study and no sampling technique is used. Data will be analyzed with SPSS version 20 and finally presented in table, graphs, charts and words.

Result: A total of 173 open and laparoscopic cholecystectomies were done in the two years period in Tibebe Ghion Specialized Hospital. One hundred thirty-two (76.3%) of patients were females and the male to female sex ratio was 1:3.2. The age distribution of studied patients ranges from 19 to 78 years and the mean age of patients were 41.82 years.

The average post-operative hospital stay of patients was 3.85 days and patients who do have admitted in emergency condition do have extended average post-operative course (7 days).

Post-operative hospital stays also affected by presence of post-operative complications average stay is 8 days.

Of all patients who have undergone cholecystectomy 20 (11.6%) develop different types of complications. Surgical site infection was the commonest complication encountered accounting 15 (71%).

Conclusion: Females are most frequently affected by cholelithiasis than males. Open cholecystectomy still is responsible for the major operative procedure conducted in gall stone patients but laparoscopic cholecystectomy is still the significant contribution of surgery. Twenty-five of patients with cholelithiasis do have additional medical illness as comorbid condition and hypertension is the commonest medical comorbid illness encountered.

The major surgical complication rates were higher in laparoscopic cholecystectomy group as compared to open cholecystectomy group which is. Surgical site infection was the commonest surgical complication encountered.

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Acronyms and abbreviations

AA- Addis Ababa

BMI. body mass index

BDI- bile duct injury

CBD_ common bile duct

IBI- iatrogenic biliary tree injury

LC- laparoscopic cholecystectomy

OC- Open cholecystectomy

QOL- Quality of life

SSI- Surgical site infection

TGSH – Tibebe Ghion Specialized Hospital

1 Introduction

1.1 Background

Gallstone disease (cholelithiasis) is one of the most common afflictions of the digestive tract. One of the most common causes of abdominal pain is the presence of gallstones. Autopsy reports show that gallstones are present in between 10% and 15% of adults. The prevalence of gallstones is related to many factors, including diet, age, gender, Body Mass Index (BMI), and ethnic background with increased prevalence in patients of Native American and Latin American descent(1).

Cholelithiasis is a disease associated with multiple risk factors. One of the main risk factors for developing the disease is being a female. It is four times higher in women than in men.(2)

Factors involved in metabolic syndrome increase the risk of developing gallstones and form the basis of primary prevention by lifestyle changes. Common mutations in the hepatic cholesterol transporter *ABCG8* confer most of the genetic risk of developing gallstones, which accounts for ~25% of the total risk. Metabolic syndrome, dyslipidemia, diabetes, and insulin resistance/hyperinsulinemia frequently co-occur in gallstone disease.(3)

The majority of individuals with gall bladder stone will not develop symptoms: up to 80% will never experience biliary pain or complications such as acute cholecystitis, cholangitis, or pancreatitis. People with such asymptomatic cholelithiasis eventually may develop symptoms (biliary pain) 2% to 3% that require treatment per year. Complicated gallstone disease (cholecystitis, choledocholithiasis, gallstone pancreatitis) develops in 3% to 5% of symptomatic patients per year.(4)

Once patients with gall bladder stone become symptomatic, they are at increase rates of developing recurrent attacks and complications. Cholecystectomy is the gold standard management option for patients who become symptomatic and for those who develop complications and it is the most commonly performed surgical procedure worldwide. Currently around 90% of cholecystectomies are done laparoscopically and it has changed the practice of management for gall bladder stone(5).

1.2 Statement of the problem

Gall stone disease affects many of the world's population. They comprise a large spectrum of disorders caused by alterations in bile composition and biliary function, placing a substantial burden on inpatient and outpatient resources. Complicated gallstone disease (e.g., symptomatic cholelithiasis) represents the most frequent of biliary disorders for which surgery is regularly advocated.

Today, cholecystectomy is a standard practice for cholelithiasis, and surgery for complicated gallstone diseases has a significant impact on quality of life (QOL) in developed countries. Over the past two decades, laparoscopic cholecystectomy (LC) has become the gold standard for the surgical treatment of gallbladder disease. A shorter hospital stay (and, thus, a more rapid return to normal activity and work), less postoperative pain, a faster recovery, better cosmesis, and lower cost are some of the advantages of LC over open surgery(6).

Surgery of gall bladder stone is not without risks and complications. Operative outcomes have consistently improved along with general advances in surgical training, diagnostic techniques, control of infection, and supportive care. The mortality rate associated with operations for calculous biliary disease has continually decreased over the last 100 years. Patient age, co-morbid disease, biliary disease status, and the type of biliary operation performed are major determinants of mortality (6).

A study done in Sweden in 2007 showed the average hospital stay was around 5 days and the mortality from cholecystectomy was around 1.8%.(7) A study done in Africa in 2003 showed mortality rate of around 0.69% for patients who has under gone open cholecystectomies and the average hospital stay was around 8 days (8).A study done in Sudan in 2014 Intraoperative complications were excessive bleeding necessitating conversion in 0.74 % and biliary ducts injury in 0.31%. Postoperative complications were wound infection in 0.21%, incisional umbilical hernias in 0.28% of patients and the conversion to open cholecystectomy was necessary in 5.13%. The mortality rate was 0.21% (6).

A study done in St Paul's teaching hospital, Addis Ababa, Ethiopia in 2014, Major surgical complications were seen in 19(2.9%) patients(9). There is no study done in bahir dar assessing of the determining factors of cholecystectomy and surgical outcome of patients with gall bladder

stone and studies done in Ethiopia did not include large number of patients and did not address the determinant factors in detail. Hence this study could serve as base line data for further study and it could give some input for the hospital managerial to see how the hospital is functioning.

Therefore, the purpose of this study was to assess the complications that could come following surgical management of gall bladder stone disease and the underlying factors that are going to increase the rate of complications and also to know the short-term outcome of patients who are managed surgically.

1.3 Justification and significance of the study

Profiling patients with gall bladder disease could provide data on the prevalence of cholelithiasis, rate of procedure done on patients with gall bladder disease, type of surgical complications that has happened and short-term outcome of patients in different aspects. Furthermore, exploring surgical outcomes of patients with cholelithiasis admitted to this teaching specialized hospital will enable both health care providers and hospital managers. Health care providers and hospital managers can use this information to develop strategies to improve health care delivery for these patients and for formulating policies on preventive measures of complications. The researcher was also prompted to explore the burden of the problem, complications and preventive measures in the region. This research could determine magnitude of cholelithiasis, different complications of the disease, options of surgical management of the disease, the complications that has happened following surgery and short-term outcome of the surgical management.

In line with the above attributes and defined objectives, this study might had multifaceted benefits to managing health professionals, hospital management, regional health bureau, stakeholders, ministry of health and communities at large by assessing treatment outcomes and contributing factors of mortality and to take appropriate action to the problem, to maximize the quality of health care delivery and multidisciplinary team approach.

2.Literature review

2.1 Epidemiology of gall stone disease

In a systematic review done in Canada, University of Calgary, in 2011, Gallstones constitute a significant health problem in developed societies, affecting 10% to 15% of the adult population, meaning 20 to 25 million Americans have (or will have) gallstones. Since most of patients with gall bladder stone are asymptomatic, expectant management is an appropriate choice for silent gallstones in the general population. The exception is patients at high risk for experiencing biliary complications (4).

A study done in Nigeria in 2005, the male to female ratio of cholelithiasis was 1:4.8. Only 8.7% of these patients were obese. About 69.6% were multiparous. Many of the patients have been on treatment for suspected peptic ulcer disease for a period ranging from four weeks to five years.(10)

A study done in Ethiopia, Ayider referral hospital, in 2013, A total of 225 patients were included in the study. The age group 30-49 years comprised one-half of the patients and over two-thirds (71.6%) of the patients were female. Abdominal pain was the predominant complaint, including right upper quadrant pain (74.7%), epigastric pain (20%), and left upper quadrant pain (4.9%). About one-third (34.7%) had radiation of the pain to the back and 15.6% to the shoulders. Fatty meal was identified as an exacerbating factor in 62.2% of the patients. One hundred and eighty-four patients were operated on; laparoscopy was done in 30.2%, and open cholecystectomy (OC) in 51.6%. Only two patients had a complicated immediate post-operative course (2). A three-year retrospective analysis done in Tikur Anbessa Hospital (TAH), cholelithiasis accounted for 10.3% of the total surgical admissions. (11)

A study done in Ethiopian, Paulos Tertiary Referral Hospital, in2018, the prevalence of gallstone was 10.2% and it is more common in females,72.7%(12).

2.2. Natural History of Cholelithiasis

As a study done in Italy in 2006, the majority of cases (80%) will not become symptomatic. Most stones are incidentally found during routine abdominal ultrasonography. Asymptomatic gallstone patients are at low risk of developing symptoms, since 10% and 20% will eventually become symptomatic within 5 and 20 years of diagnosis, respectively. Thus, the average risk of

developing symptomatic gallstones is low and approaches 2.0-2.6% per year. Small gallstones, by contrast, may migrate from the gallbladder through the cystic duct and stop in the choledocus (choledocholithiasis), a condition known to increase the chance of symptoms and major complications, such as acute pancreatitis(13).

2.3. Management of Cholelithiasis

In systematic review done in Netherland in 2018, the majority of patients with gallstones are not aware of their presence. Conservative management is recommended for patients with asymptomatic gallstones. Gallstone size could be related to the risk of gallbladder carcinoma. Patients with gallstones equal to or larger than 3cm may have a 9.2 higher risk of gallbladder carcinoma than those with stones less than 1cm and hence prophylactic cholecystectomy might be important to decrease the risk of gall bladder carcinoma(14).

As a review study done in Italy in 2018, Cholecystectomy is the most commonly performed surgical procedure worldwide in patients who develop symptoms and/or complications of cholelithiasis of any type. Cholecystectomy per se, however, might cause abnormal metabolic consequences, i.e., alterations in glucose, insulin (and insulin-resistance), lipid and lipoprotein levels, liver steatosis and the metabolic syndrome. Nowadays around 90% of procedures are done laparoscopically and laparoscopic cholecystectomy is the gold standard management option of cholelithiasis. Even in the era of laparoscopic cholecystectomy, around 20-30 % of cholecystectomies are still done through the open approach(15).

A study done on admitted patients in Portland in 2009, there was a 16% increase in the volume of LC and a corresponding decrease in open procedures over the 10 years period((16).

In study done in Ethiopia, Ayider referral hospital, in 2017, laparoscopic cholecystectomy was done in 30.2%, and open cholecystectomy in 51.6% (2) another study in Addis Ababa in 2014 showed open cholecystectomy is responsible for about 91.2% of procedures and laparoscopic cholecystectomy accounts for about 8.8% (9).

2.4. Risk factors and comorbidities of cholelithiasis

Being female is the main risk factor for cholelithiasis. Many risk factors for cholesterol gallstone formation are not modifiable such as ethnic background, increasing age, female gender and family history or genetics. Conversely, the modifiable risks for cholesterol gallstones are obesity,

rapid weight loss and a sedentary lifestyle. The rising epidemic of obesity and the metabolic syndrome predicts an escalation of cholesterol gallstone frequency. Risk factors for biliary sludge include pregnancy, drugs like ceftriaxone, octreotide and thiazide diuretics, and total parenteral nutrition or fasting. Sludge include pregnancy, drugs like ceftriaxone, octreotide and thiazide diuretics, and total parenteral nutrition or fasting(4).

A study done in Ethiopia, St. Paulos hospital, in 2018, Gallstones were more prevalent among females than males (female/male ratio: 11.2 to 1) ($P < 0.05$). About 65 cases of 3287 gallstone patients were associated with comorbidities or disorders. The major associated comorbidities with gallstones were an umbilical hernia, Diabetes mellitus (DM), hydrops (over-distended gallbladder filled with mucoid), and empyema (acute cholecystitis)(12).

2.5. Complications of Cholecystectomy

In a randomized clinical trial done in Pandora in 2017, Surgical site infections occurred in 12% patients in OC group and there was no incidence of infection in LC group. Hospital stay was also prolonged in OC group as compared to LC group. Hospital stay was 6.44 ± 3.76 days in OC group and 3.48 ± 2.06 in LC group(17).

A study done in Greece in 2015, bile duct injuries (BDIs) associated with LC was 0.62% and for open cholecystectomy it was around 0.38%. There was one death associated with BDI after LC. Only two (15.4%) of the BDIs associated with LC occurred within the proposed learning curve limit of 50 LCs per individual surgeon(18).

In retrospective study done in Finland in 2015, registered data included 17175 LCs and 4942 OCs and 1.3 % of from laparoscopic surgery received red blood cell (RBC) transfusion compared to 13 % of the patients in the OC group. Similarly, the proportions of patients with platelet (0.1 % vs. 1.2 %, $p < 0.001$) and fresh frozen plasma (FFP) products (0.5 % vs. 5.8 %) transfusions were respectively higher in the OC group than in the LC group. The mean transfused dose of RBCs, PTLs and FFP or the mean cost of the transfused blood components did not differ significantly between the LC and OC groups (19).

In historic cohort study done in Chicago 2007, surgical site infection (SSI) was found around 3.6% of patients who undergone cholecystectomy(20).

In cohort study undertaken in Canada in 2014, early cholecystectomy was associated with a lower risk of major bile duct injury [0.28% vs 0.53%] or death (1.36% vs 1.88%). Total hospital length of stay was shorter with early cholecystectomy (mean difference 1.9 days). No significant differences were observed in terms of open cholecystectomy or in conversion among laparoscopic cases (11% vs 10%)(21).

In population based retrospective cohort study done in New York in 1998, A total of 78.7% of the 30,968 patients who underwent cholecystectomy as a principal procedure in New York State in 1996 underwent laparoscopic cholecystectomy. The mortality rate was lower for laparoscopic cholecystectomy than for the open procedure (0.23% vs 1.90%, $P < .0001$). The prevalence rate of the 8 most common complications among cholecystectomy patients was also much lower among patients undergoing laparoscopic cholecystectomy((22).

In a cohort study done in Malta in 1993, the type of surgical access did not influence the symptomatic outcome but had a significant bearing on the time to return to work or full activity after surgery (laparoscopic cholecystectomy two weeks, open cholecystectomy eight weeks)(23).

In a retrospective study done in South Africa in 2003, there were two major duct injuries in the OC group and one cystic duct leak in the LC group. The high conversion rate of 17.9% attests to the severity of their chronic disease making safe dissection in Calot's triangle problematic. The mortality in patients undergoing OC was 1 (0.07%) and 0% for LC(8).

In retrospective study done in Ethiopia, St. Paulos Teaching Hospital, in 2014, major surgical complications were seen in 19(2.9%) patients but adequate information was found for 16 patients only with a retrieval rate of 84.2 %. Of the 16 patients 14(87.5%) were female. Thirteen patients had open cholecystectomy and the rest 3 patients had laparoscopic cholecystectomy.

Accordingly, the rate for open cholecystectomy was 13/588(2.21%), and that of laparoscopic surgery 3/57(5.26%). Twelve (92.3%) of the complicated cases in open cholecystectomy were done by residents alone. The rate of complications for the consultants in open surgery was 0.2% and that of the residents 6.0%. The odd that patients operated by residents will develop IBDI were 6.25 times higher than that of the seniors. There is statistically significant association between seniority and major surgical complications (9).

3. Objectives of the study

3.1 General objectives

- ✚ To assess the different magnitude of cholecystectomy complications and associated patient characteristics in TGSH, Bahir Dar.

3.2 Specific objectives

- ❖ To determine the magnitude of cholecystectomy complications in TGSH.
- ❖ To describe the outcomes of cholecystectomy using patients' characteristics in TGSH.

4. Methods and materials

4.1 Study area and period

The study was conducted Bahir Dar city North West Ethiopia. Bahir Dar is the capital of Amhara Regional State, located 578 km away North West of Addis Ababa. The city has 5 sub cities and 16 Kebeles. The total population of the city is 750,991 by 2016. The city has two specialized hospitals, one district hospital, 4 private hospitals, eight higher clinics and health centers owned by government and private sectors. TGSH started functioning in November 2019 and has more than 500 hundred beds for inpatient management and serving more than 7 million peoples from parts of Amhara and Benishangul Gumuz as in patient and outpatient treatment.

General Surgery is among the 4 major departments having around 108 beds divided into different units. There are 14 General surgeons, 2 hepatic pancreaticobiliary surgeons, 1 neurosurgeon, 1 head and neck surgeon, 1 chest surgeon and 2 Urosurgeons. There are 45 General Surgery residents attending residency program and 1 general practitioner working in department of Surgery. There are around 40 trained nurses working in different units of surgery. The study was conducting from January 1,2019 to December 15, 2020.

4.2 Study design

A hospital based cross-sectional study that employs patient chart document review was conducted in TGSH.

4.3 Source and study population

Patients who are admitted in TGSH with diagnosis of cholelithiasis and being managed surgically from January2019 to December 2020.

4.4 Sample size determination

$$\Rightarrow n = \frac{(Z_{1-\alpha/2})^2 \times p \times (1-p)}{d^2}$$

The largest complication rate encountered is 15.4% (Greece,2015) and p value was 0.154 and Q was 0.85.

The largest complication rate encountered is 15.4% (Greece,2015) and p value was 0.154 and Q was 0.85.

and the sample size was $n = (1.96) (1.96) (0.154) (0.85) / (0.05) (0.05)$

n= 201

since I was not having that much number of cases, I used total count of cases in the study period and hence no sampling technique was used.

4.5 Sampling procedures

All patient charts with cholelithiasis and operated were analyzed and no sampling procedure was used.

4.6 Inclusion criteria and exclusion criteria

4.6.1 Inclusion criteria

All patients with the diagnosis of cholelithiasis and managed surgically during the study period at TGSB and whose case files were complete.

4.6.2 Exclusion criteria

Patients with the diagnosis of cholelithiasis but did not undergo surgery.

4.7 Variables of the study

The independent variables are age, sex, time of presentation, type of operation, mode of admission, patient condition, duration of symptoms, underlying comorbidities and address. The dependent variable is the outcome.

4.8 Operational definitions

Discharged improved: patient who has undergone operation discharged without complications.

Went against medical advice: family of the patient or the patient refused continuation of inpatient management and leave the hospital while patient was not a candidate for discharge.

Disappeared: the family took the patient or the patient leave the hospital while getting medical management without awareness of managing team.

Inpatient death: patients who are operated for cholelithiasis and died in hospital despite management.

Short term outcome: patient's clinical condition after treatment until the patient has been discharged from the hospital.

Duration of hospital stay: post operative hospital stay of patients before discharge

4.9 Data collection tools and procedures

After identifying the patients from the registers, their folders (case files) were retrieved from the hospital records and examined individually by the investigator(s). Data collection was done with the aid of structured forms (checklists) designed for the study. The diagnosis of cholelithiasis is based on clinical and Para clinical evaluation (as documented by doctors in the patient's case files). Patient's history obtained from the folders, imaging report. Further information that was obtained from these case files was include; mode of admission, type of operation and complications.

4.10 Data processing and analysis

Data was entered, cleaned, stored and checked for its completeness and internal consistency. The soft copies of the data were stored on hard drive and back up copy on separate drive. Later both hard copy and soft copy was stored by flash disks and hard disk and processed using SPSS program version 23 and descriptive analysis done on the data to know the relationship between the dependent and independent variables outcomes. Finally, the analyzed data was described using tables, graphs and figures accordingly.

4.11 Ethical considerations

Ethical approval by the review board to the research and permission from the hospital management, head nurse and research review committee of Bahir Dar University College of medicine and health science to do the research will be taken to use available information in the ward. This data will not be used for other purpose other than the research and confidentiality of study units.

4.12 Dissemination of research finding

Based on the findings, after conclusion and recommendation, one soft copy and two hard copy of the research paper will be submitted to Bahir Dar University College of medicine and health

science. Publication of the research in known journals will be tried to make it available online for citation.

5. Result

5.1 Sociodemographic Status

A total of 173 open and laparoscopic cholecystectomies were done in the two years period in Tibebe Ghion Specialized Hospital. One hundred thirty-two (76.3%) of patients were females and the male to female sex ratio was 1:3.2. The age distribution of studied patients ranges from 19 to 78 years and the mean age of patients were 41.82 years. About ninety-seven (56.1%) of patients come from urban region

Table 1: Sex distribution of patients operated cholelithiasis patients in TGSH, ANRS, Ethiopia, 2019-2020

| Variable | Value | Percent |
|---------------|-------|---------|
| Male | 41 | 23.7 |
| Female | 132 | 76.3 |
| Total | 173 | 100 |

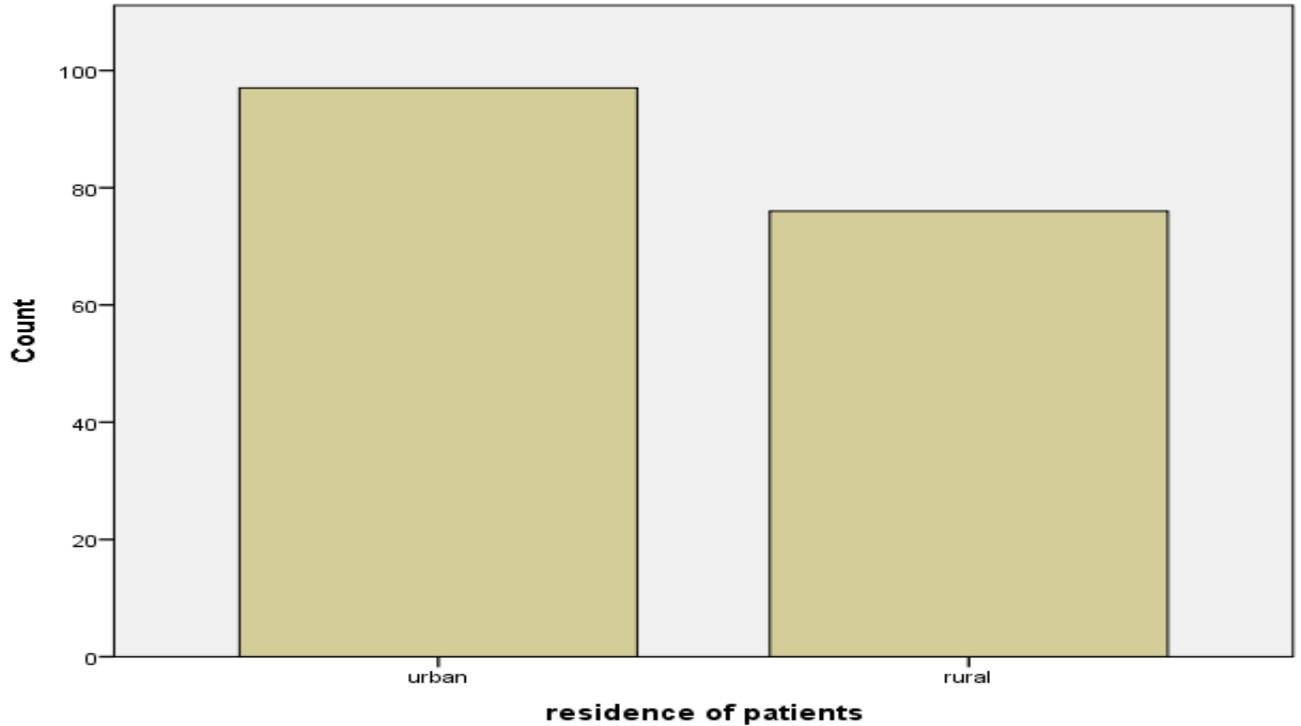


Figure 1 frequency distribution of place of residence of the study subjects, TGSH, ANRS, Ethiopia 2019-2020.

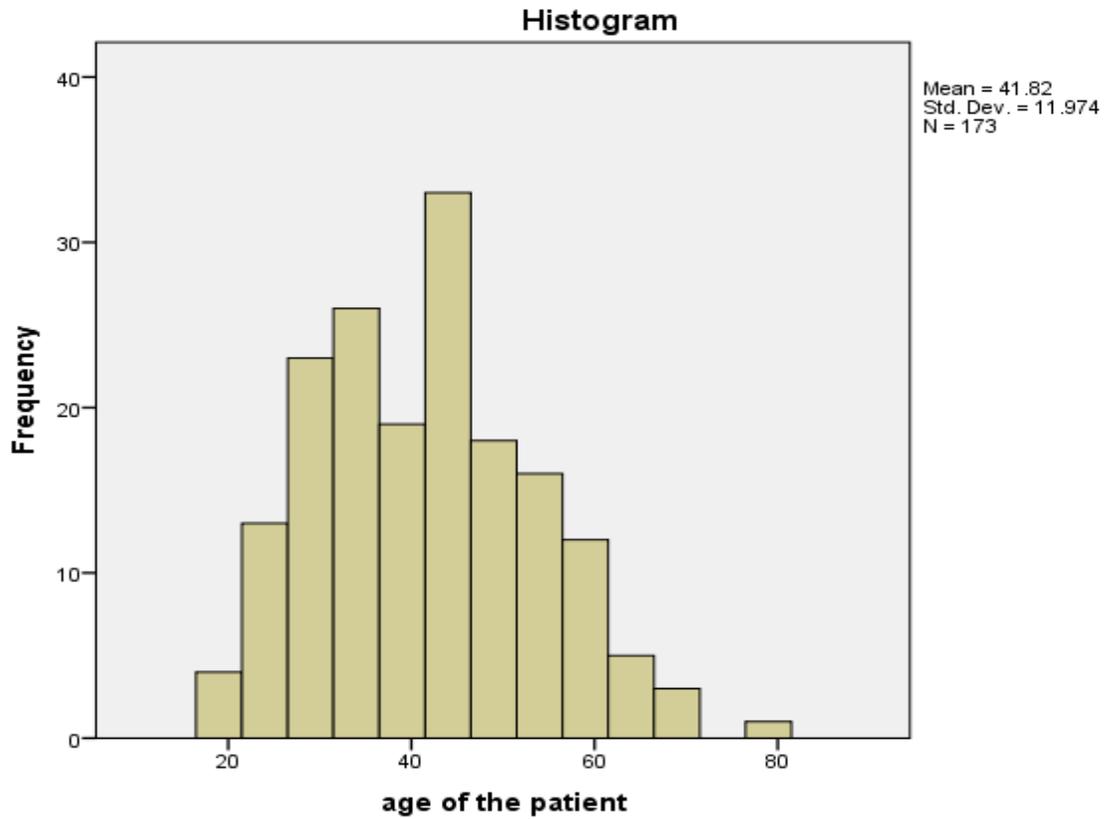


Figure2: Age distribution of operated patients in TGSH, ANRS, Ethiopia 2019-2020.

5.2 Clinical profile of patients

Almost all patients do have symptom of abdominal pain and 86 (49.7%) of patients do have abdominal bloating as a manifestation.

Table2: distribution of symptoms among operated patients in TGSH, ANRS, Ethiopia 2019-2020.

| Symptom | Frequency | Percent |
|--------------------|-----------|---------|
| Abdominal pain | 173 | 100 |
| Vomiting | 66 | 38.2 |
| Abdominal bloating | 86 | 49.7 |
| Loss of appetite | 80 | 46.2 |
| Others | 11 | 6.4 |

The average post-operative hospital stay of patients was 3.85 days and patients who do have admitted in emergency condition do have extended average post-operative course (7 days).

Post-operative hospital stays also affected by presence of post-operative complications average stay is 8 days.

Table3: Mode of admission and average hospital stay among operated patients in TGSH, ANRS, Ethiopia 2019-2020.

| | | duration of hospital stays | |
|-------------------|-----------|----------------------------|--|
| | | Mean | |
| mode of admission | Emergency | 7 | |
| | Elective | 3 | |

Table4: Presence of complication and average hospital stay of operated patients in TGSH, ANRS, Ethiopia 2019-2020

| | | | | duration of hospital stays | |
|---------------------------|-----|---------------------------|-----|----------------------------|--|
| | | | | Mean | |
| presence of complications | No | presence of complications | No | 3 | |
| | | | yes | . | |
| | Yes | presence of complications | No | . | |
| | | | yes | 8 | |

Ninety (52%) of patients were operated through open approach and the open conversion rate of laparoscopic operation was 3(3.6%).

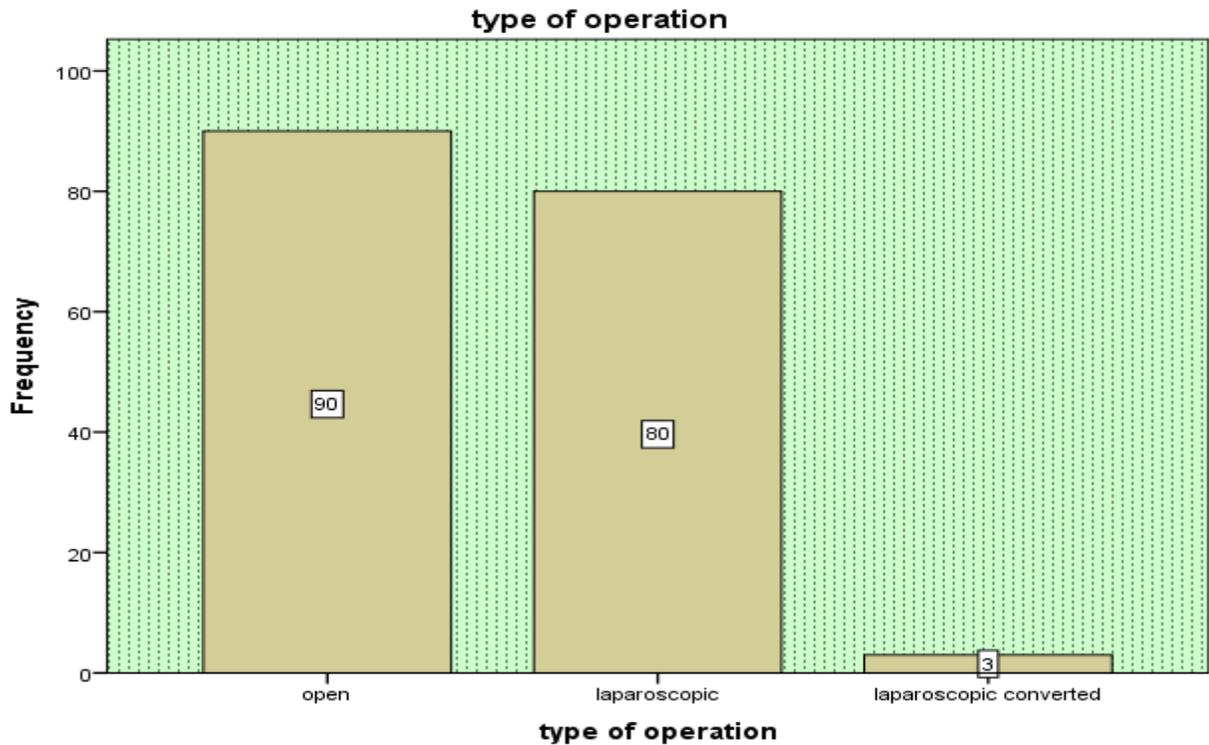


figure3: Operative approaches of patients operated patients in TGSH, ANRS, Ethiopia 2019-2020

The average post-operative stay of patients who had been operated laparoscopically are shorter than open Approach.

Table5: type of operation and average post-operative hospital stay.

| | | duration of hospital stays | |
|-------------------|------------------------|----------------------------|----|
| | | Mean | |
| Type of operation | Open | | 4 |
| | Laparoscopic | | 3 |
| | laparoscopic converted | | 22 |

Of all patients who have undergone cholecystectomy, 25(14.5%) of patients do have additional comorbid conditions. Among these, hypertension is the most frequently identified comorbid condition accounting 15 (51%) of comorbid cases.

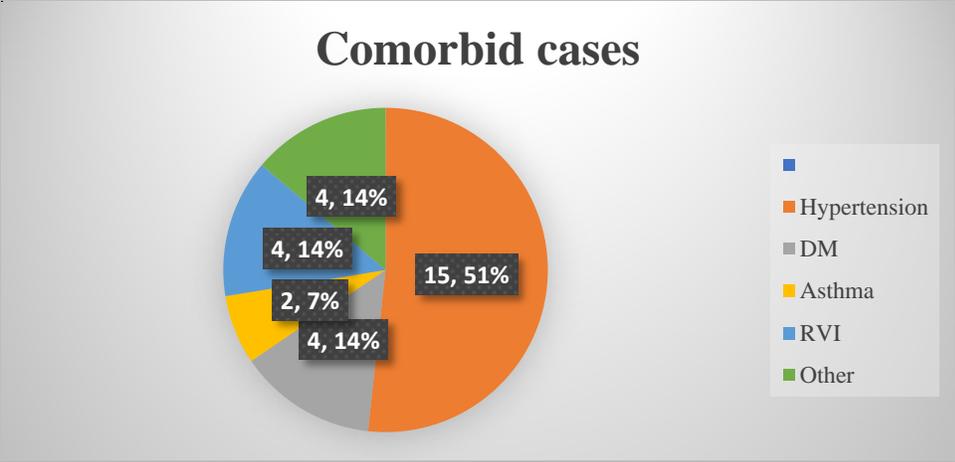


figure4: Proportion of cases among comorbid cases operated patients in TGSH, ANRS, Ethiopia 2019-2020.

5.3 Surgical management outcomes

Of all patients who have under gone cholecystectomy 20 (11.6%) develop different types of complications. Surgical site infection was the commonest complication encountered accounting 15 (71%).

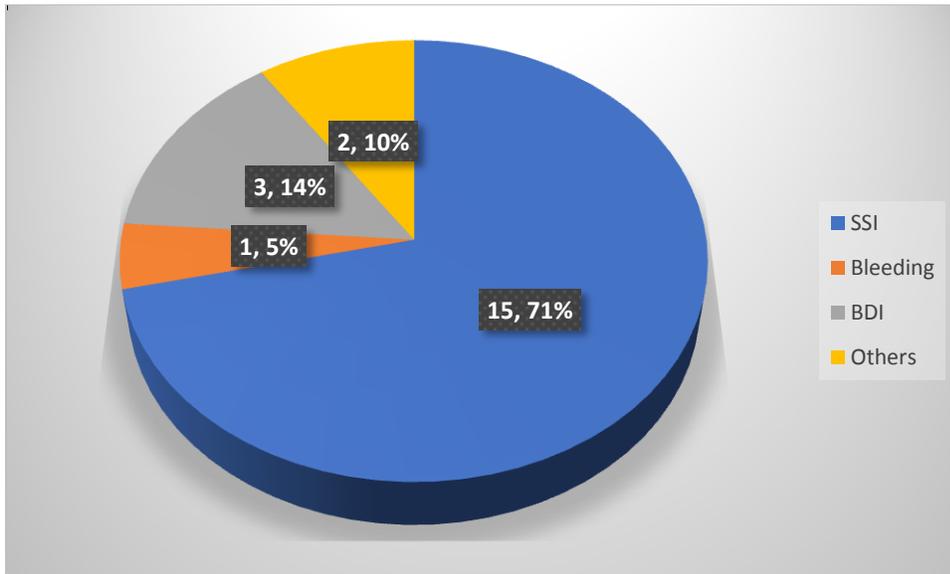


figure5: Rate of specific surgical complications among operated patients in TGSH, ANRS, Ethiopia 2019-2020.

The overall acute surgical complications were slightly higher in laparoscopic operations 11(13.25%).

Table6: Surgical complication rate and mode of operation among operated patients in TGSH, ANRS, Ethiopia 2019-2020

| | Total | Complications | Percent |
|---------------------|--------------|----------------------|----------------|
| Laparoscopic | 83 | 11 | 13.25 |
| Open | 90 | 9 | 10 |

The overall surgical complication rate was higher for patients who have undergone emergency cholecystectomy 7(26.92%).

Table7: surgical complication rate and mode of admission among operated patients in TGSH, ANRS, Ethiopia 2019-2020

| Mode of admission | Total | Complicated cases | Percent |
|-------------------|-------|-------------------|---------|
| Emergency | 26 | 7 | 26.92 |
| Elective | 147 | 13 | 8.84 |

The presence of medical comorbidities increased the rate of surgical complications 4(16%). The overall surgical complication rates were higher among female patients 16(12.12%). The surgical complication rate was almost similar among urban and rural areas (11.3).

Table8: comorbidities and residence with corresponding surgical complication rates among operated patients in TGSH, ANRS, Ethiopia 2019-2020.

| | | Total | Complicated cases | Percent |
|----------------------|--------|--------------|--------------------------|----------------|
| Comorbidities | Yes | 25 | 4 | 16 |
| | No | 148 | 16 | 10.8 |
| Sex | Male | 41 | 4 | 9.76 |
| | Female | 132 | 16 | 12.12 |
| Residence | Rural | 76 | 9 | 11.84 |
| | Urban | 97 | 11 | 11.34 |

6. Discussion

Gallstones constitute a significant health problem in developed societies, affecting 10% to 15% of the adult population. A study done in Ethiopia, Ayider referral hospital, in 2013, A total of 225 patients were included in the study. The age group 30-49 years comprised one-half of the patients and over two-thirds (71.6%) of the patients were female and A study done in Ethiopian, Paulos Tertiary Referral Hospital, in 2018, the prevalence of gallstone was 10.2% and it is more common in females, 72.7% (12). These studies are almost similar to our study finding in which females were affected 76.3% of patients and the male to female sex ratio was 1:3.2 but different from a study done in Nigeria in 2005, where the male: female ratio of cholelithiasis was 1:4. This may be due to different geographical, cultural and socioeconomical nature of the two study areas. A study done in Ethiopia, Ayider referral hospital, in 2013, abdominal pain was the predominant complaint, which is consistent to our finding that almost all patients do have complaints of abdominal pain.

Currently worldwide around 90% of procedures are done laparoscopically and laparoscopic cholecystectomy is the gold standard management option of cholelithiasis. Even in the era of laparoscopic cholecystectomy, around 20-30 % of cholecystectomies are still done through the open approach (15). A study in Addis Ababa in 2014 showed open cholecystectomy is responsible for about 91.2% of procedures and laparoscopic cholecystectomy accounts for about 8.8% (9) which is far below our research finding in which 90 (52%) of patients were operated through open approach and laparoscopic operation was responsible for about 83 (47.8%) of cases. This may be due to the fact that we are living in developing countries as compared to worldwide and as a result of different study period and increased rate of training to laparoscopic surgery when compared to a study done in Addis Ababa.

The study showed surgical site infection was the commonest complication encountered among all operated patients 15 (8.67%), which is lower than a study done in Pandora (17 and higher than a study done in Chicago 2007 (20). The average hospital stay was prolonged in open

cholecystectomy group (4days) as compared to laparoscopic operation (3 days) which is a similar finding in a study done in Pandora (17). This may be due to the different study area and study period the two studies conducted and also may be due to the different socioeconomic character of the study groups.

In a retrospective study done in South Africa in 2003, there were two major duct injuries in the OC group and one cystic duct leak in the LC group which is consistent to our research finding two bile duct injury in the open group and one in the laparoscopic group and different from a study done in Greece (18). The laparoscopic conversion rate in our study was 3.61% which is much lower than the rate in South Africa 2003 (8). This may be due to the learning curve of laparoscopic surgery since its development in 1980.

7. Conclusion

Females 132(76.3%) are most frequently affected by cholelithiasis than males 41(23.7%). Open cholecystectomy 90 (52.02%) still is responsible for the major operative procedure conducted in gall stone patients but laparoscopic cholecystectomy is still the significant contribution of surgery (47.98%). Twenty-five (14.5%) of patients with cholelithiasis do have additional medical illness as comorbid condition and hypertension is the commonest medical comorbid illness encountered 15 (8.67%). The post-operative hospital stay of patients (3 days) was shorter in patients who were operated laparoscopically. Post-operative hospital stay also prolonged (7 days) in patients who are admitted in emergency as compared to elective admission (3days).

The major surgical complication rates were higher in laparoscopic cholecystectomy group 11 (13.25%) as compared to open cholecystectomy group which is 9(10%). Surgical site infection was the commonest surgical complication encountered 15 (8.67%). Surgical complication rate also increased in patients who are admitted and operated in emergency condition 7 (26.92) as compared to elective admission and operation 13 (8.84%).

8. Limitations

As this study was retrospective cross sectional and the study population not representative of the general population the study findings may not be representative.

This review, being of a short duration and small sample size, necessitates continuing review of the cases and undergoing research of longer duration to identify the different factors responsible for the post-operative outcomes.

9. Recommendations

1. It is highly recommended that prospective study should be done to investigate the post-operative outcome of cholecystectomies as it gives time cohort.
2. It is highly recommended to study a large group of individuals to identify the different factors responsible for the post-operative outcome.
3. It is recommended for the hospital to follow the standard protocols and to develop guideline to minimize the rate of surgical site infection.

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Annex 1

SECTION A

DATA CAPTURING SHEET

DEMOGRAPHIC DATA OF THE PATIENT

1. Serial number
2. Gender
 - A. Male
 - B. Female.....
3. Residence
 - A. urban.....
 - B. Rural.....
4. Age of the patient
 - A. <30
 - B. 30-40
 - C. >40

SECTION B

5. Date of admission.....
6. Category of patients.
 - A. symptomatic.....
 - B. asymptomatic.....

7. Type of symptom.

A. abdominal pain

B. vomiting

C. abdominal bloating

D. loss of appetite

E. others

8. Date of discharge.....

9. Duration of hospital stay

10. Presence of comorbidities.

A. yes.....

B. No.....

11. Mode of admission

A. Emergency

B. Elective

12. Type of operation

A. open.....

B. laparoscopic.....

C. laparoscopic converted.....

13. Complications

A. bleeding

B. surgical site infection

C. biliary tree injury (bile leak)

D. Death

E. others

14. Type of surgeon

A. consultant

B. resident

