

## Profile of Cholelithiasis Underwent *Laparoscopic Cholecystectomy* Patients at The Aloe Saboe Hospital

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### ABSTRACT

**Introduction:** Cholelithiasis is one of the critical health problems. Modern lifestyles can allow gallstone disease in Indonesia to become a health problem that needs attention. The research objective is to know the profile of patients with cholelithiasis who performed laparoscopic cholecystectomy in Aloe Saboe Hospital.

**Method:** The research design is a retrospective descriptive study. The population of this study was cholelithiasis patients who underwent laparoscopic cholecystectomy and were treated from January 2020 - December 2021, totaling 234 people. The number of samples is 86 people. We were using a purposive sampling data analysis technique, namely univariate analysis.

**Results:** Regarding the distribution of patients based on sex, the most results were obtained from females (70 people, 81.4%), the largest age group is 46-55 years old (23 people, 26.7%), and the majority of patients did not have a history of diabetes mellitus (76 people, 88.4%).

**Conclusion:** The distribution of cholelithiasis patients who underwent laparoscopic cholecystectomy in the Aloe Saboe Hospital is most common in women aged 46-55, and most patients have no history of diabetes mellitus. This finding may offer a primary data reference for further research adding the number of variables to determine the risk factors for cholelithiasis.

**Key words:** Cholecystectomy, cholelithiasis, gallstones, laparoscopic



**Published by:**  
Universitas Negeri Gorontalo

**Mobile number:**  
+62852 3321 5280

**Address:**  
Jl. Jend. Sudirman No.6, Gorontalo  
City, Gorontalo, Indonesia

**Email:**  
jmhsj@ung.ac.id

**Article History:**  
Received 09 February 2023  
Accepted 31 July 2023  
Published 31 July 2023

**DOI:**  
<https://doi.org/10.37905/jmhsj.v2i1.18845>

## **Introduction**

Cholelithiasis is a gallstone disease found in the bladder bile, bile ducts, or both. Gallstones, mainly Cholesterol-type gallstones, are primarily formed in the gallbladder.<sup>1</sup> Cholelithiasis At present, it has become a public health problem because of the frequency of its occurrence, causing financial and social burdens.<sup>2</sup> According to WHO data (World Health Organization), the prevalence of cholelithiasis globally is 11.7%.<sup>3</sup> In the United States 2017, data was obtained from cholelithiasis sufferers of around 20 million people (10 - 20% adult population).<sup>4</sup> According to recent data, the prevalence of cholelithiasis in Japan is approx 3.2%, in China 10.7%, in North India 7.1%, and in Taiwan 5.0%.<sup>5</sup> Research in Indonesia at Home Koja Jakarta Regional General Hospital on 05 October – 31 December 2015 obtained 101 cases of cholelithiasis.<sup>6</sup> Meanwhile, the medical record data at the Kandou Hospital Manado, in October 2015 - October 2016, obtained 113 cases.<sup>7</sup>

Based on oral cholecystography studies, cholelithiasis occurs most in women (76%) than in men (36%) with the age of the patient > 40 years.<sup>2</sup> Cholelithiasis is often associated with "5F" risk factors: Fat, Female, Forty/Family history, Fair, and Fertile.<sup>8</sup> In addition, cholelithiasis can also occur due to factors other risks such as excessive secretion of bilirubin, genetic disorders, diabetes mellitus, total parenteral nutrition, metabolic syndrome, drug use, and other risk factors.<sup>4</sup> Cholelithiasis can cause complications in the form of acute cholecystitis and may cause perforation and peritonitis, obstructive jaundice, cholangitis, pancreatitis, and malignant change.<sup>9</sup> About 80% of people with cholelithiasis are found without symptoms during diagnosis or monitoring. Hence, most cases of cholelithiasis are said to be "silent" or also called asymptomatic.<sup>10</sup>

Management of cholelithiasis can be divided into two types: surgery and non-surgery. Non-surgical therapy can be in the form of stone splitting, namely stone dissolution with preparations of cholelytic bile salts, Extracorporeal Shock Wave Lithotripsy (ESWL), and endoscopic removal. At the same time, surgical therapy can be done by laparoscopic cholecystectomy, open cholecystectomy, and exploration of the choledochal canal.<sup>9</sup> Cholecystectomy is the gold-standard therapy for cholelithiasis. Laparoscopic and open surgical methods can perform this procedure. Laparoscopic cholecystectomy offers faster gallstone healing with invasive procedures, minimal pain, mild pain, and early return to total activity. Currently, laparoscopic cholecystectomy is the treatment of choice for symptomatic gallstones.<sup>11</sup> Based on initial observations made by the author at the Aloei Saboe Hospital Gorontalo in 2020 - 2021, data was obtained on the number of cases of cholelithiasis patients

in whom 234 people performed laparoscopic cholecystectomy.

Cholelithiasis is a significant health problem in Western countries. Meanwhile, in Indonesia, it is suspected that the incidence of gallstone disease is still lower compared to Western countries. However, with the lifestyle trend, Modern technology can allow gallstone disease in Indonesia in the future to become a health problem that needs attention. Based on the description, this study aims to determine the profile of patients with cholelithiasis whose laparoscopic cholecystectomy was performed in the Aloe Saboe Hospital from January 2020 –December 2021.

### **Methods**

This research was conducted using a retrospective descriptive study, namely analysis describing the social demographic factors on the incidence of cholelithiasis in hospitals of Prof. Dr. H. Aloe Saboe. The data were collected from medical records from January 2020 – December 2021 that fit the inclusion criteria. Furthermore, the collected data was compiled to determine the profile of cholelithiasis patients who have performed laparoscopic cholecystectomy at the hospital.

### ***Population and Sample***

The population in this study were all patients with cholelithiasis laparoscopic cholecystectomy performed in the Aloe Saboe Hospital treated in January 2020 – December 2021, namely 234 people. The inclusion criteria in this study were patients undergoing inpatient and outpatient care at Aloe Saboe Hospital and patients diagnosed with cholelithiasis or one the diagnosis was cholelithiasis, and a laparoscopic cholecystectomy was performed. Criteria Exclusions in this study were incomplete patient medical records (no CM number, data on age, sex, and history of blood sugar checks) and patients diagnosed with cholelithiasis without laparoscopic cholecystectomy. From the population of 234 people, using the purposive sampling technique obtained a sample of 92 people with CM numbers. Then it got 86 people who met the criteria for the variable under study.

### ***Data Analysis***

The data obtained in this study were processed using a device Microsoft Excel software and Statistical Product and Service Solution (SPSS) version 25.0 for Windows (IBM, USA) and presented in tabular form to see the profile of cholelithiasis patients. Laparoscopic cholecystectomy was performed in the form of age profile, gender, and history of diabetes mellitus.

## Results

Based on the research conducted, the characteristics of cholelithiasis patients are shown in Table 1. It shows the characteristics of the study sample by category last education; the majority of patients are at the high school level (SMA)/equivalent (26 people, 30.2%), with the majority of patients being housewives stairs (53 people, 61.6%).

**Table 1.** Demographic Characteristics of Study Participants

Characteristics	Total (n)	Percentage (%)
<b>Final Education</b>		
Elementary school/equivalent	26	30.2
Middle School/Equivalent	20	23.3
High School/equivalent	27	31.4
3rd Diploma	2	2.3
1st degree	9	10.5
2nd degree	2	2.3
<b>Profession</b>		
Housewife	53	61.6
Self-employed	7	8.1
Farmer	5	5.8
Honorary	4	4.7
State Civil Service	3	3.5
Retired	3	3.5
Civil Servants	2	2.3
Contract worker	1	1.2
Police	1	1.2
TNI	1	1.2
Nurse	1	1.2
College student	1	1.2
Casual Worker	1	1.2
Unemploy	3	3.5

Table 2 shows the characteristics of the research sample based on the diagnosis category; the highest result was cholelithiasis (71 people, 82.6%). Based on complications, most patients had difficulties (69 people, 80.2%), with the most complications, namely cholecystitis + GB adhesions (27 people, 31.4%). Based on comorbidities, most patients had comorbidities (50 people, 58.1%), with the most comorbidities, namely hepatomegaly (8 people, 31.4%). Based on blood pressure, the highest results were obtained typically (120-129 and/or 80-84 mmHg) (33 people, 38.4%). Based on blood sugar levels, The highest results obtained were normal blood sugar levels (GDS <200 mg/dL and GDP < 126 mg/dL) (79 people, 91.9%).

Table 3 shows the distribution of cholelithiasis patients carried out

Laparoscopic Cholecystectomy at Aloei Saboe Hospital from January 2020 – December 2021 based on gender, age, and history of diabetes mellitus. The most results were women (70 people, 81.4%), from age group 46-55 years (23 people, 26.7%), and had no history of diabetes mellitus (76 people, 88.4%).

**Table 2.** Clinical Characteristics of Cholelithiasis Underwent Laparoscopic Cholecystectomy Patients at The Aloei Saboe Hospital

Characteristics	Total (n)	Percentage (%)
<b>Diagnosis</b>		
Cholelithiasis	71	82.6
Multiple cholelithiasis	15	17.4
<b>Complication</b>		
Yes	69	80.2
No	17	19.8
<b>Comorbidity</b>		
Yes	50	58.1
No	36	41.9
<b>Blood Pressure (mmHg)</b>		
120 and < 80	23	26.7
120-129 and/or 80-84	33	38.4
130-139 and/or 84-89	0	0
140-159 and/or 90-99	18	20.9
160-179 and/or 100-109	14	4.7
≥ 180 and/or ≥ 110	0	0
≥ 140 and < 90	8	9.3
<b>Blood Glucose (mg/dL)</b>		
< 200	76	88.4
≥ 200	7	8.1
≤ 126	3	3.5

**Table 3.** Distribution of Cholelithiasis Underwent Laparoscopically Cholecystectomy Patients at Aloei Saboe Hospital Based on Gender, Age, and History of Diabetes Mellitus

Characteristics	Total (n)	Percentage (%)
<b>Gender</b>		
Female	70	81.4
Male	16	18.6
<b>Age (years)</b>		
17 – 25	2	2.3
26 – 35	9	10.5
36 – 45	22	25.6
46 – 55	23	26.7
56 – 65	19	22.1
≥ 65	11	12.8
<b>History of Diabetes Mellitus</b>		
Yes	10	11.6
No	76	88.4

## **Discussion**

Based on the results of this study, it was found that most of the patients with cholelithiasis who underwent laparoscopic cholecystectomy were women. From the results, we can conclude that most cholelithiasis patients were women. The results of research conducted by Albab (2012) on patients with cholelithiasis at Central General Hospital of Dr. Wahidin Sudirohusodo Makassar found that the proportion of cholelithiasis patients based on sex, most were women (61 people, 70.12%) and the lowest were men (26 people, 29.88%).<sup>12</sup> This research is in line with research by Nurhikmah et al. (2018) in cholelithiasis patients in the digestive surgery department of RSI Siti Rahmah Padang; it was found that as many as 11 patients (57%) were women and eight men (42.1%).<sup>14</sup>

Research conducted by Sueta (2014) at Central General Hospital of DR. Wahidin Sudirohusodo Makassar showed that of the 114 patients, most of them female (88 people, 77.2%) and the lowest was male (26 people, 22.8%). This research is in line with research in America conducted by Stender (2013) found 265 cases of cholelithiasis in women and 89 cases in men. This study, based on gender, found a significant relationship between the genders of women with cases of cholelithiasis. The highest incidence of cholelithiasis evidence is in females than males.<sup>15</sup> The influence of hormones on women is one risk factor for the increasing number of female patients compared to males. Estrogen suspected. It plays an essential role in women, where estrogen can stimulate liver lipoprotein receptors and increase the formation of bile cholesterol.<sup>13</sup>

Research by Girsang (2012) on patients with cholelithiasis being treated while staying at Elisabeth Hospital in Medan found that the majority of patients were male (56 people, 55.4%), and the lowest were women (45 people, 44.6%).<sup>16</sup> This research aligns with Zamani's report in Iran, obtained based on gender; the highest yield was male (3057 people, 57.1%).<sup>17</sup> In both studies, it was found that most cases of cholelithiasis were men. It does not mean the type male genitalia are more at risk for suffering from cholelithiasis. Still, because of sufferers, more men who go to hospitals in Iran and Elisabeth Hospital in Medan are men than women.<sup>16,17</sup>

Epidemiological and clinical studies show that the prevalence of cholelithiasis is two times higher in women than men of all ages in every population studied. The hormonal changes that occur during pregnancy put women at greater risk higher. The increase in estrogen levels during pregnancy induces significant metabolic changes, including the formation of cholesterol and bile supersaturation and reduced gallbladder motility

(gallbladder hypomotility), both factors which increase the formation of gallstones.<sup>18,19</sup> Women, especially during the fertile period, are twice as likely to experience stones bile as men. This is due to the influence of the sex hormone estrogen, which can increase cholesterol absorption in food and the secretion of bile cholesterol.<sup>10</sup>

The present study found that 86 patients with cholelithiasis performed laparoscopic cholecystectomy, most in the age group of 46-55 years (23 people, 26.7%) and the lowest in the age group 17-25 years (2 people, 2.3%). Research from Febyan (2017), at Koja Hospital, the age of most sufferers of cholelithiasis is > 40 years (88 people, 86%). This research aligns with research by Nurhikmah et al. (2018) in the digestive surgery department of RSI Siti Rahmah Padang. It was found that most cholelithiasis patients were in the age group of 40-49 years (7 people, 36.8%), and the lowest was in the age group 70-79 years (1 person, 5.3%).<sup>14</sup> Research from Andra (2017), in the Surgery Department of Central General Hospital of DR. M. Djamil In Padang, reveals the prevalence of cholelithiasis patients was 7.5%. Most of the age group is 50, with an average age of 51.9.<sup>20</sup> Results of this study are in line with what was done by Girsang (2012) on cholelithiasis patients who were hospitalized at Elisabeth Hospital in Medan obtained most of the samples in the age group > 40 years (64 people, 63.4%). However, the lowest was in the age group ≤ 40 years (37 people, 36.6%). Age > 40 years more at risk of developing cholelithiasis due to increased cholesterol secretion in the liver bile. In addition, as we get older, gallstones are very rare spontaneous dissolution.<sup>16</sup>

Research by Sueta (2014) at DR. Wahidin Sudirohusodo Hospital in Makassar found that age ≤ 40 has a significant relationship with the incidence of cholelithiasis was 95 cases (83.3%) compared to age > 40 years, namely 19 cases (16.7%).<sup>13</sup> The same results in a study in Taiwan showed an increase in cases of cholelithiasis in the age group of 20-39 years. This condition shows the presence of change in high-risk age cohorts with cholelithiasis.<sup>21</sup> Incidence increase in cholelithiasis at the age of <40 years is probably caused by an interaction of other factors such as the gender of the patient is female or male, the patient's age is <40 years also comorbid diabetes mellitus, obesity, and hyperlipidemia.<sup>13</sup>

The age group over 40 years has a high risk of cholelithiasis because increasing age is associated with hypersecretion of cholesterol, decreased secretion of bile salts, and decreased bile acids.<sup>10</sup> Epidemiological and clinical studies have found that cholelithiasis is rare in children and adolescents, and the prevalence of cholelithiasis increases parallel to age in both sexes.<sup>22</sup> With increasing age occurs an increase in cholesterol levels in the body that causes an increased risk of gallstone formation. In addition, the contractility of the gallbladder

decreases with time. Increasing age causes relative stagnation of bile which causes gallstones and their complications.<sup>19</sup>

This study found that of the 86 patients with cholelithiasis who underwent laparoscopic cholecystectomy, most did not have a history of diabetes mellitus (76 people, 88.4%). Moreover, the lowest were patients with a history of diabetes mellitus (10 people, 11.6%). The results of research conducted by Muzakki (2017) on gallstones patients with dyslipidemia and diabetes mellitus at the Central General Hospital Fatmawati found the proportion of cholelithiasis sufferers who had a history of diabetes mellitus as many as 11 people (13.9) and who did not have a history of diabetes mellitus as many as 68 people (86.1%).<sup>18</sup> Research by Sueta (2014) at the Wahidin Sudirohusodo Hospital in Makassar found the highest number of cholelithiasis sufferers who had a history of diabetes mellitus, as many as 103 patients (90.4%) and who had no history diabetes mellitus in 11 patients (9.6%).<sup>13</sup> From this explanation, it can be explained that patients with a history of diabetes mellitus or newly diagnosed diabetes mellitus from complaints and blood glucose laboratory results can be at risk of causing gallstones.<sup>18</sup>

Theoretically, the main risk factors for cholelithiasis are the 5F, namely: Fat, Female, Forty/Family history, Fair, and Fertile. <sup>8</sup> However, other risk factors are wrong, including diabetes mellitus. Diabetes mellitus is a closely related disease associated with the risk of developing cholelithiasis. It cannot explain the definitive cause of gallstones in diabetes mellitus patients certainty. However, due to the influence of neuropathy, the autonomic disorder in the gallbladder's contractility causes hypomotility so that the ability to empty the gallbladder decreases and has implications on gallbladder over-volume as a risk factor for gallstone formation.<sup>23</sup> Patients with diabetes mellitus have high blood glucose levels, which can inhibit gluconeogenesis, so that should be converting the fat into glucose to energy will accumulate in the tissues, causing cholesterol synthesis increases and will produce cholesterol deposits in the gallbladder.<sup>24</sup>

The author had yet to examine some of the other risk factors in the present study, such as the assessment of cholesterol levels that may contribute to the incidence of cholelithiasis. Further study must accommodate this limitation.

## **Conclusion**

The results of the distribution of cholelithiasis patients who underwent laparoscopic cholecystectomy in the Aloe Sabote Hospital in the period January 2020 – December 2021 found the most incidents in patients who were female (70 people, 81.40%) age group 46-55



years (23 people, 26.7%). Most patients had no history of diabetes mellitus (76 people, 88.4%). This finding may offer a primary data reference for further research by increasing the number of variables to explore the risk factors for cholelithiasis.

### **Conflicts of Interest**

Nothing to declare

### **Funding sources**

Nothing to declare

### **Acknowledgments**

Nothing to declare

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