

A Clinical Study of Prevalence and Surgical Management of Cholelithiasis**Mohammed Ibrahim**Associate Professor, Department of General Surgery, Government Medical College and Hospital,
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Received: 25-02-2024 / Revised: 23-03-2024 / Accepted: 22-04-2024

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Conflict of interest: Nil

Abstract:

Background: Cholelithiasis, a chronic recurrent condition affecting the hepatobiliary system, is marked by the formation of gallstones due to impaired metabolism of cholesterol, bile acids, and bilirubin. Cholelithiasis prevalence is escalating in regions like India due to shifts in dietary patterns, necessitating surgical interventions in many cases. This study aimed to assess the prevalence, causes, and surgical management of cholelithiasis cases at our tertiary care center in southern India.

Methods: Forty consecutive cholelithiasis cases were enrolled based on predetermined criteria. Detailed patient histories were recorded, encompassing socioeconomic status, symptom nature and duration, past medical history, dietary habits, oral contraceptive pill (OCP) use, and alcohol consumption. Comprehensive clinical examinations were conducted. Diagnostic investigations included complete blood count, electrocardiogram (ECG), liver function tests (LFT), blood glucose, blood urea, serum creatinine, urine analysis, chest X-ray, and abdominal ultrasound.

Results: Out of n=40 cases n=18 were males and n=22 were females. Pain in the right upper abdomen (right hypochondrium) is the most frequent symptom, reported by 97.5% of patients. *Other Common Symptoms:* Tenderness (95.0%) and nausea/vomiting (60.0%) are also reported by a significant proportion of patients. *Less Frequent Symptoms:* Jaundice (15.0%), dyspepsia (25.0%), fever (7.5%), guarding (30.0%), and mass (7.5%) are reported less frequently. 27 underwent laparoscopic cholecystectomy, with 4 cases requiring conversion to open cholecystectomy due to intraoperative findings. Ultimately, 23 laparoscopic cholecystectomies were completed, comprising 9 males and 14 females. Additionally, 17 cases underwent open cholecystectomy, with 9 males and 8 females

Conclusion: Cholelithiasis incidence is rising, with a female predominance. Ultrasonography proved pivotal in diagnosis. Multiple stones and gallbladder thickening were prevalent. The laparoscopic-to-open cholecystectomy conversion rate was 12%, with minimal postoperative complications and satisfactory follow-up outcomes.

Keywords: Cholelithiasis, Laparoscopic cholecystectomy, Open cholecystectomy, prevalence.

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Introduction

Cholelithiasis is a frequent occurrence among patients in the Department of Surgery, often necessitating surgical interventions. Ancient Indian literature from 800 B.C. to 400 A.D. described jaundice as "pittaashmarijanya," meaning jaundice caused by a stone in the bile, which could also be induced by dietary indiscretions [1]. Globally, it is estimated that at least 10% of adults will develop gallstones, with 20% of individuals over 40 years old and 30% over 70 years old demonstrating the presence of biliary calculi [2]. Recent trends indicate a rise in cholelithiasis incidence due to the increased availability of refined foods. In Europe, autopsy studies show a prevalence of 18.5%, with rates ranging from 5% in Ireland to 38% in Sweden [3]. In Australia, prevalence varies between 15% and 25%, while the Pima Indian tribe of Arizona exhibits the highest prevalence, with total and

female rates of 49% and 73%, respectively [4]. In India, incidence is on the upswing, attributed primarily to westernization, widespread access to ultrasound investigations in urban and rural areas, improved affordability due to socio-economic changes, and reduced costs of medical investigations. Complications associated with gallstones include acute and chronic cholecystitis, choledocholithiasis, cholangitis, pancreatitis, gallstone ileus, empyema gallbladder, mucocele, perforation, and, rarely, external compression of the biliary tree by a large gallstone within the gallbladder (Mirizzi syndrome). Diagnosing cholelithiasis involves a thorough medical history, clinical examination, and appropriate blood and radiological investigations, primarily ultrasonography and computed tomography. Cholecystectomy is the most common surgical

intervention, offering immediate relief from symptoms. Given the scarcity of data on cholelithiasis prevalence in our population, we conducted this study to ascertain the prevalence, etiology, and surgical management of cholelithiasis among patients presenting to the Department of General Surgery.

Material and Methods

This cross-sectional study was carried out at the Department of General Surgery, Government Medical College, and Hospital Mahboobabad. with approval from the Institutional Ethical Committee. The study was conducted from August 2022 to March 2024. Written consent was obtained from all participants after explaining the nature of the study in vernacular language.

Inclusion Criteria

1. Patients exhibiting signs and symptoms of gallstones.
2. Diagnosis of cholelithiasis confirmed through investigations.
3. Willingness to participate voluntarily.
4. Ineligibility for medical therapy.

Exclusion Criteria

1. Presence of significant co-morbid conditions affecting surgical fitness.
2. Patients managed by non-surgical methods.
3. History of previous cholelithiasis with relapse.

Forty consecutive cases with cholelithiasis meeting the inclusion and exclusion criteria were enrolled in the study. Detailed history-taking included socio-economic status, symptom nature, and duration, previous similar complaints, dietary habits, history of oral contraceptive pill (OCP) use, and alcohol consumption. "A standardized clinical assessment was conducted, comprising a comprehensive physical examination and systemic evaluation, with a specific focus on identifying tenderness in the right hypochondrium, palpable masses in the same area, and hepatomegaly. Diagnostic investigations included a complete blood count, random blood sugar test, liver function test, routine urine analysis, and abdominal ultrasound (USG). Surgical procedures included either open cholecystectomy or laparoscopic cholecystectomy.

Table 1: Demographic profile of the cases of cholelithiasis included in the study

Age in years	Male	Female	Total (%)
11 – 20	1	0	1(2.5%)
21 – 30	2	2	4(10.0%)
31 – 40	3	4	7(17.5%)
41 – 50	5	10	15(37.5%)
51 – 60	4	6	10(25.0%)
61 - 70	3	0	3(7.5%)
Total	18	22	40(0.0%)

Table 2 describes the frequency and percentage of signs and symptoms reported in 40 cholelithiasis

Patient Selection for Gallbladder Surgery: A meticulous selection process determined the type of gallbladder surgery offered to each patient. Factors considered included: Surgical History: Any prior surgeries, particularly abdominal procedures, were reviewed to assess potential risks and ensure suitability for the chosen procedure. Body Mass Index (BMI): Obesity can influence surgical approach. BMI might influence decisions regarding laparoscopic vs open surgery. Age: Age can be a factor in considering surgical risks and potential recovery time. Underlying Medical Conditions: Pre-existing medical conditions were evaluated to ensure the patient could safely undergo surgery and anesthesia.

Surgical Drainage and Hospital Stay: Following open cholecystectomy (where the abdomen is opened), a subhepatic tube drain was typically placed. This drain collects bile or other fluids that may accumulate after surgery and is connected to a drainage bag (urosac bag) for collection. The duration of postoperative hospitalization varied depending on the type of surgery performed. Patients typically remained in the surgical ward for 3 to 8 days, with shorter stays possible for uncomplicated laparoscopic procedures.

Postoperative Care and Follow-Up: Following discharge, patients received regular follow-ups to monitor their recovery and address any potential complications. This might involve clinic visits and communication with healthcare providers. If any complications arose, necessary interventions were promptly implemented.

Results

Table 1 describes the age and gender distribution of 40 patients with cholelithiasis (gallstones) included in a study. **Age Distribution:** The 41-50 age group has the highest number of patients (15 or 37.5%). **Gender Distribution:** There were more females (22) than males (18) included in the study. However, the overall difference is relatively small (55% female, 45% male). The higher prevalence in the 41-50 age group might reflect an increased risk of gallstone formation with age. Although there are slightly more females, the gender distribution suggests cholelithiasis can affect both genders.

(gallstones) cases included in a study. **Upper Right Abdominal Pain Most Common:** Pain in the right

upper abdomen (right hypochondrium) is the most frequent symptom, reported by 97.5% of patients. *Other Common Symptoms:* Tenderness (95.0%) and nausea/vomiting (60.0%) are also reported by a significant proportion of patients. *Less Frequent Symptoms:* Jaundice (15.0%), dyspepsia (25.0%), fever (7.5%), guarding (30.0%), and mass (7.5%) are reported less frequently. Pain in the right upper

abdomen is a hallmark symptom of cholelithiasis, potentially due to inflammation or irritation of the gallbladder or surrounding tissues. Tenderness during palpation in the same area might indicate inflammation of the gallbladder or bile duct. Nausea and vomiting can occur due to irritation or blockage of the biliary system caused by gallstones.

Table 2: signs and symptoms recorded in the cases of cholelithiasis in the study

Symptoms/signs	Frequency	Percentage
Pain in the right hypochondrium	39	97.5
Nausea/ vomiting	24	60.0
Jaundice	6	15.0
Dyspepsia	10	25.0
Fever	3	7.5
Tenderness	38	95.0
Guarding	12	30.0
Mass	3	7.5

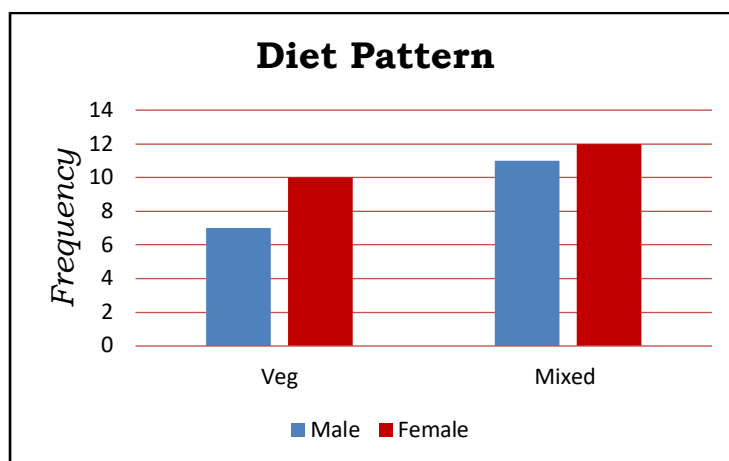


Figure 1: Type of diet in 40 cases of cholelithiasis included in the study

Figure 1 describes the dietary habits (vegetarian or mixed diet) of the 40 patients with cholelithiasis (gallstones) included in the study. *Mixed Diet More Common:* Among the 40 patients, more individuals follow a mixed diet (23) compared to a vegetarian diet (17). While the data suggests a slightly higher prevalence of mixed diet the difference might not be statistically significant.

Table 3: Showing the Ultrasonographic findings of 40 cases of cholelithiasis in the study

USG Findings	Frequency	Percentage
Stones in the gallbladder	40	100.0
Solitary stone	10	25.0
Multiple stones	32	80.0
Bile duct stones	6	15.0
Thickening of gallbladder	33	82.5
Dilated bile duct	5	12.5
Mass	3	7.5

Table 3 summarizes the ultrasound (USG) findings in 40 patients with cholelithiasis (gallstones) included in the study. *All Patients Have Gallstones:* Every patient (100%) had stones in their gallbladder, confirming the diagnosis of cholelithiasis with ultrasound. *Multiple Stones More Common:* Among those with gallstones,

multiple stones (80%) were more frequent than solitary stones (25%). *Other Findings:* Thickening of the gallbladder wall (82.5%) was a prevalent finding, potentially indicating inflammation. Other findings like bile duct stones (15.0%), dilated bile duct (12.5%), and mass (7.5%) were less common. The presence of multiple stones and gallbladder

wall thickening might suggest chronic cholelithiasis or inflammation.

Table 4: Type of surgery performed in the cases of the study

Type of surgery	Frequency	Percentage
Open cholecystectomy	17	42.5
Laparoscopic cholecystectomy	23	67.5
Total	40	100

Among the total of 40 patients, 27 underwent laparoscopic cholecystectomy, with 4 cases requiring conversion to open cholecystectomy due to intraoperative findings. Ultimately, 23 laparoscopic cholecystectomies were completed, comprising 9 males and 14 females. Additionally, 17 cases underwent open cholecystectomy, with 9 males and 8 females, as depicted in Table 4. Gallstone analysis indicated that 84% of cases had mixed-type cholesterol stones, 10% had pure cholesterol stones, and 6% had pigmented stones. Histopathology reports indicated that 38 patients had chronic cholecystitis, while 2 patients had acute cholecystitis, with no instances of malignancy observed. In nearly all instances, the postoperative recovery phase proceeded without incident. Vomiting occurred in 4% of cases but was effectively addressed with antiemetic medication. Approximately 8% experienced severe pain, which was satisfactorily alleviated with analgesics. During the 3-month follow-up period, no complications were noted.

Discussion

In our present study, we observed the highest occurrence of cholelithiasis in individuals during their fifth decade, a trend consistent with previous studies in this field [5-8]. Additionally, we identified a predominance of females among cholelithiasis cases. Bhattacharya R et al. [9] study reported that 71.4% of cases were female and 28.6% were male. Similar gender imbalances favoring females were also noted by other researchers [7,10,11]. On the contrary few studies have found more males than females such as AP Tamhankar et al. [10], Ganey et al. [7], and Alok Sharma et al. [11] reported series where 70% were males and 30% were females. The most commonly reported site of pain was the right hypochondrium, followed by the epigastrium. Ten percent of patients reported pain radiating to the back. 97.5% percent of patients experienced chronic recurring pain, while only 5% reported an acute onset. The nature of the pain was predominantly colicky. 25 percent of patients reported experiencing dull aching pain, a presentation similar to those observed in the studies conducted by Alok Sharma et al. [11], Ganey et al. [7], and Goswitz [12]. Positive Murphy's sign was present in 14% of patients, while a palpable mass was detected in 10% of patients. This mass could result from distention of the gallbladder or the adherent

omentum overlaying the inflamed gallbladder. Nausea and vomiting were reported in 60% of cases in our study, with vomiting typically occurring spontaneously, particularly during painful episodes. Additionally, jaundice was observed in 15% of patients, attributed to the presence of stones in the common bile duct. 27.5 percent of patients reported experiencing dull aching pain, a presentation similar to those observed in the studies conducted by Alok Sharma et al. [11], Ganey et al. [7], and Goswitz [12]. Positive Murphy's sign was present in 15% of patients, while a palpable mass was detected in 10% of patients. This mass could result from distention of the gallbladder or the adherent omentum overlaying the inflamed gallbladder. The patients underwent exploration of the common bile duct, during which stones were extracted. 25 percent of patients presented with dyspepsia. Endoscopic examination in these cases did not reveal any underlying pathology, but ultrasound scans showed the presence of gallstones. Dyspeptic symptoms were alleviated following cholecystectomy. The incidence of dyspepsia in our study was comparable to that reported in the series by Ganey et al. [7] and Alok Sharma et al. [11]. Fever was documented in 7.5% of patients, attributed to cholangitis resulting from biliary obstruction. Upon reviewing their medical histories, no significant past events were noted in any of the cases studied. 57.5 percent of patients reported consuming a mixed diet, while 15% were classified as alcohol consumers and 15% were obese. The most commonly employed incision for open cholecystectomy was the right subcostal incision a few cases underwent a right paramedian incision and a right transverse incision. Exploration of the common bile duct was performed in seven patients, resulting in the successful retrieval of stones. In two patients, the common bile duct was closed with T-tube drainage. Operative room times for open cholecystectomy ranged from 65 to 100 minutes, with an average duration of approximately 70 minutes, whereas laparoscopic cholecystectomy durations ranged from 100 to 130 minutes, with an average of approximately 110 minutes. Chronic cholecystitis was diagnosed in 38 patients, with acute cholecystitis observed in 2 patients. These findings align with those reported in the series by Bhattacharya R et al. [9] and Raza MH et al. [13]. Minor postoperative complications were encountered, all of which were adequately

managed, and there were no issues during the follow-up period for any patient.

Conclusion

The current study concludes that the incidence of cholelithiasis is on the rise, with a notable predominance of female cases. Pain localized in the right hypochondrium emerges as a common presenting symptom. Ultrasonography emerged as the preferred diagnostic modality for these cases, revealing multiple gallstones and gallbladder thickening in the majority of instances. The conversion rate from laparoscopic to open cholecystectomy stood at 12%. Post-operative complications were minimal, and no adverse events were reported during the follow-up period.

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