



## ANALYSIS OF THE CLINICAL CHARACTERISTICS OF CHOLE-LITHIASIS AND ITS RELATIONSHIP TO HISTOLOGICAL RESULTS

Dr. Yogesh Gode

Assistant Professor Dept. of General Surgery Jawaharlal Nehru Medical College, Datta Meghe Institute of Medical Sciences Sawangi (Meghe) Wardha

**Article Info:** Received 15 January 2020; Accepted 19 February, 2020

**Corresponding author:** Dr. Yogesh Gode

**Conflict of interest statement:** No conflict of interest

### ABSTRACT:

**Background:** One of the commonest gastro-intestinal ailments and a major financial strain on the healthcare system is gall stone disease. Gallstone formation is facilitated by the bile becoming concentrated and the gallbladder not emptying completely and frequently.

**Aims and objectives:** In the current study, we looked at the link between histological findings and the clinical characteristics of chole-lithiasis.

**Material and Methods:** The current research was an observational, prospective, hospital-based study that examined patient gall-bladder samples who had already received a chole-lithiasis clinical diagnosis.

**Results:** There were 200 total specimens examined. In the fourth decade, there were the most cases. 64 men (32%) and 136 women (68%) participated in our study. Male to female ratio was 1:2, with more women than men. With a ratio of 5.6:1, non-vegetarians were more negatively impacted than vegetarians. In our study, 35% of subjects with a BMI >30 kg/m<sup>2</sup> were obese. In 110 patients (or 55%), pain in the right hypochondrium was the most prevalent symptom. In 80% of the instances, multiple stones were the most frequent stones seen. Gross examination revealed that the gall-bladder was thicker in 57% of cases. In our research, the gallstones ranged in size from 0.2 to 3 cm, with the majority measuring 0.2 cm (25%). In our research, chronic nonspecific chole-cystitis was the most prevalent lesion, occurring in 80% of cases. The most frequent types of stones in patients with chronic nonspecific chole-cystitis were mixed stones (71%). In follicular chole-cystitis, pigment stones were common (8%); in xanthogranulomatous chole-cystitis, both pigment and cholesterol stones were present (1%).

**Conclusion:** Females and non-vegetarians are more likely to have chole-lithiasis. The bulk of the instances had multiple stones, and biochemical research revealed that most of the stones were mixed varieties.

**Keywords:** chole-lithiasis, multiple stones, biochemical analysis, cholecystectomy, histopathological diagnosis

### Introduction:

The epidemiology of gallstones is both fascinating and frustrating. It is fascinating because it contains the key to understanding the genesis of the disease; if we know precisely who contracts the condition, we can begin to determine how they contracted it<sup>1</sup>. One of the commonest gastro-intestinal ailments and a major financial strain on the healthcare system is gall stone disease. Chole-lithiasis is a prevalent condition that affects 10% to 20% of the global population and 11% of the general US population. According to reports, gall stone disease affects between 2% and 9% of the population in India<sup>2</sup>. In North India, it happens ten times more often than in South India. The discrepancy in prevalence rate between the two

regions is thought to be caused by dietary inadequacies<sup>3</sup>. Despite being an adenocarcinoma, it is now widely acknowledged that chole-lithiasis is a significant risk factor for enabling the development of gall-bladder cancer. A frequent digestive surgical illness called chole-lithiasis is characterized by stomach pain, nausea, vomiting, and jaundice. Gallstone formation is facilitated by the bile becoming concentrated and the gallbladder not emptying completely and frequently<sup>4</sup>. The presence of proteins in the liver and bile that either encourage or hinder cholesterol crystallization into gallstones constitutes the second factor. Increased estrogen levels brought on by pregnancy, hormone therapy, or the use of birth control pills may raise bile

cholesterol levels and reduce gallbladder mobility, which can lead to the development of gallstones<sup>5</sup>.

**Aims & objectives:** In the current study, we sought to examine the clinical characteristics of cholelithiasis and their relationship to histological results.

### Material and Methods

The current research was an observational, prospective, hospital-based study carried out in an Indian tertiary care hospital. The institutional ethical committee approved the study.

**inclusion standards:** patients who previously had a cholelithiasis clinical diagnosis.

Specimens sent as acalculous cholecystitis and with a past diagnosis of cancer are excluded.

For the patients chosen for the study, demographic information, clinical information, and operation information were gathered. Gallstones were removed from the cholecystectomy specimens, which were then freshly sliced open, tagged with the appropriate histopathological number, and had their biochemical

makeup examined. A minimum of three sections were removed from the fundus, body, and neck of the gall-bladder before the specimens were preserved in 10% buffered formalin. The tissue was prepared using standard histological methods, including paraffin embedding, 4-micron sectioning, and hematoxylin and eosin staining. Gallstones were biochemically analyzed using conventional techniques for cholesterol (Lieberman's Buchard reaction), calcium, oxalates, phosphates, and carbonates. Descriptive statistics were used in the statistical analysis.

### Results

There were 200 total specimens examined. Our study's age range was from 18 to 90 years old. The oldest patient was 90 years old, and the youngest patient was 18 years old. In the fourth decade, there were the most cases. 64 men (32%) and 136 women (68%) participated in our study. With a male to female ratio of 1:2.1, there were more females than men. With a ratio of 5.6:1, non-vegetarians were more negatively impacted than vegetarians. In our study, 35% of subjects with a BMI >30 kg/m<sup>2</sup> were obese.

**Table 1: General characteristics**

| General characteristics | No. of cases | Percentage of cases |
|-------------------------|--------------|---------------------|
| Age in years            |              |                     |
| 18 – 30                 | 48           | 24%                 |
| 31 – 40                 | 72           | 36%                 |
| 41 – 50                 | 42           | 21%                 |
| 51 – 60                 | 26           | 13%                 |
| 61 – 70                 | 8            | 4%                  |
| >70                     | 4            | 2%                  |
| Gender                  |              |                     |
| males                   |              | 68%                 |
| females                 |              | 32%                 |
| BMI kg/m <sup>2</sup>   |              |                     |
| >30                     | 70           | 35%                 |
| <30                     | 130          | 65%                 |
| Diet                    |              |                     |
| Mixed diet              | 170          | 85%                 |
| Vegetarian              | 30           | 15%                 |

In 110 patients (or 55%), pain in the right hypochondrium was the most prevalent symptom.

**Table 2: Clinical features**

| Clinical features        | No. of cases | Percentage of cases |
|--------------------------|--------------|---------------------|
| Pain right hypochondrium | 110          | 55 %                |
| pain epigastric region   | 60           | 30 %                |
| Jaundice                 | 30           | 15 %                |

In 80% of the instances, multiple stones were the most frequent stones seen. Gross examination revealed that the gall-bladder was thicker in 57% of cases. In our research, the gallstones ranged in size from 0.2 to 3 cm, with the majority measuring 0.2 cm (25%)

**Table 3: Gallstones characteristics**

| Characteristics          | No. of cases | Percentage of cases |
|--------------------------|--------------|---------------------|
| Number of gallstones     |              |                     |
| Multiple stones          | 160          | 80%                 |
| Single stones            | 40           | 20%                 |
| thickness of gallbladder |              |                     |
| >3mm                     | 114          | 57%                 |
| <3mm                     | 86           | 43%                 |
| Size of the gallstones   |              |                     |
| 0.2mm                    | 50           | 25%                 |
| 0.3mm                    | 20           | 10%                 |
| 0.4mm                    | 10           | 5%                  |
| 0.5mm                    | 40           | 20%                 |
| 1.0mm                    | 20           | 10%                 |
| 1.5mm                    | 10           | 5%                  |
| 2.0mm                    | 20           | 10%                 |
| 3.0mm                    | 30           | 15%                 |

The most prevalent lesion in our study, chronic non-specific chole-cystitis, was present in 80% of cases.

**Table 4: Spectrum of lesions of the gall-bladder gallbladder**

| Spectrum of lesions of the gall-bladder | No. of cases | Percentage of cases |
|---|--------------|---------------------|
| Chronic nonspecific chole-cystitis      | 80%          |                     |
| Follicular chole-cystitis               | 8%           | 24%                 |
| Xanthogranulomatous                     | 2%           | 36%                 |
| Acute on chronic chole-cystitis         | 4%           | 21%                 |
| Well differentiated adenocarcinoma      | 4%           | 13%                 |
| Infiltrating papillary carcinoma        | 1%           | 4%                  |
| Adenosquamous carcinoma                 | 1%           | 2%                  |

The most frequent types of stones in patients with chronic nonspecific chole-cystitis were mixed stones (71%). In follicular chole-cystitis, pigment stones were common (8%); in xanthogranulomatous chole-cystitis, both pigment and cholesterol stones were present (1%). In 4% of instances, mixed stones were related to acute or chronic chole-cystitis. Both mixed and pigment stones were observed in 3% of the 6 cases of adenocarcinoma each.

**Table 5: Correlation of types of gallstones and lesions of gall-bladder**

| Diagnosis                          | Mixed | Pigment stones | Cholesterol stones |
|------------------------------------|-------|----------------|--------------------|
| Chronic nonspecific chole-cystitis | 71 %  |                |                    |
| Follicular                         |       |                | 8%                 |
| Xanthogranulomatous                | 2%    | 1 %            | 1 %                |
| Acute on chronic                   | 4%    |                |                    |
| Carcinoma(n=12)                    | 3 %   | 3 %            |                    |

## Discussion

The most frequent biliary pathology is cholelithiasis. The prevalence of gallstones varies between 10% and 20% worldwide. Around the world, there are huge regional variations in the occurrence of gallstones<sup>6</sup>. It is predicted to be around 4% in India. Gallstones are 7 times more common in north Indians than in south Indians, according to an epidemiological research limited to rail road workers. Cholesterol, mixed, black pigment, and brown pigment stones are the different types of gallstones<sup>7</sup>. While pigment stones are made of calcium salts of unconjugated bilirubin, with different levels of cholesterol and protein, cholesterol and mixed gallstones are generated from biliary sludge. Gallstone complications might include biliary cirrhosis, gallstone pancreatitis, gallstone ileus, and gallbladder malignancy. According to our study, the majority of cases (36%) fell between the ages of 31 and 40, which is comparable to the findings of Mohan et al., who found that the majority of cases fell within the fourth decade. The incidence of Thamil Selvi et al., SK Mathur et al. peaked in the fifth decade. According to Thamil selvi et al. and Kamran et al., the most prevalent symptom in our study was pain in the right hypochondrium<sup>8</sup>. In our study, 30% of cases had epigastric pain, compared to only 15.3% in Thamil Selvi et al study. In our study, jaundice was seen in 15% of cases, although Thamil selvi et al. saw it as a presenting feature in just 3.8% of cases. In our study, patients had jaundice because they had delayed presentation of obstructive symptoms. 97% of cholelithiasis cases in India were found to be in non-vegetarians. Similar to Thamil selvi et al., who found that nonvegetarians predominated with a ratio of 6:1, the majority of patients in our study (80%) had a mixed diet compared to vegetarians (20%) with a ratio of 4:1. Body mass index more than 30 kg/m<sup>2</sup> is considered obese, and in our analysis, 35% of cases met this definition, compared to 39% in Thamil selvi et al study, Patients with cholelithiasis tend to be overweight because their bile salt levels are lower, which causes their cholesterol levels to rise. In our study, there were more multiple stones (80%) than solitary stones (20%), which is similar to the findings of Thamil selvi et al. and SK Mathur et al., who also found a higher percentage of multiple stones. This shows that cholelithiasis with numerous stones exhibits greater symptoms than cholelithiasis with a single stone<sup>9</sup>. In our research, the size of the stones ranged from 0.2 to 3.0 cm. A single cholesterol stone was the largest stone. The size of the stones in the

study by Thamil Selvi et al. ranged from 0.3 to 2.0 cm. According to biochemical analysis, mixed stones (78%) were the most prevalent stones observed in our study, which is comparable to studies conducted in south India by Thamil selvi et al. and Chandran et al. However, a research by Taher et al., carried out in Baghdad, discovered that cholesterol stones were the most prevalent stones, underscoring once more the geographical diversity brought on by dietary habits and ethnicity<sup>10</sup>. Similar to SK Mathur et al., increased gall-bladder thickness (>3 mm) caused by chronic inflammation was observed on gross examination in 57% of cases. Histopathology revealed that the majority of cases in our study (80%) exhibited chronic nonspecific cholelithiasis, which included lymphocytes, plasma cells, histiocytes, and sporadic eosinophils, similar to studies by Mustafa Mazlum et al., SK mathur et al., and Thamil Selvi et al. In contrast to SK Mathur et al study, where follicular and xanthogranulomatous cholelithiasis were observed in 5% and 3% of cases, respectively, in our research, these conditions were seen in 8% and 2% of cases, respectively. Infection with gram-negative bacteria can cause follicular cholelithiasis, which can lead to stones. Xanthogranulomatous cholelithiasis develops when bile from mucosal ulcers or burst rokitansky aschoff sinuses enters the gall-bladder wall, and the gall-bladder's outflow is obstructed by calculi and infection. Since eosinophilic cholelithiasis is typically linked to acalculous cholelithiasis, which was not included in our study, it was not observed. In our study, 4% of instances of acute or chronic cholelithiasis were seen, whereas SK Mathur et al. reported 12% of cases. In our research, gall-bladder cancer was observed in 6% of cases. A prior clinical diagnosis of chronic cholelithiasis was included in every case. Thamil Selvi et al. and Mustafa Mazlum et al. found a reduced incidence of cancer in comparison to our study. In our study, adenocarcinoma, which was seen in 6% of cases, was equally associated with mixed and pigment stones, whereas in Mohan et al study, carcinoma was only seen in 1.09% of cases and was only associated with pigment stones. Chronic nonspecific cholelithiasis, which was seen in 80% of cases, was most frequently associated with mixed stones.

## Conclusion

The prevalence of cholelithiasis is higher in females and non-vegetarians. All variable risk factors that contribute to cholelithiasis should be lessened, especially for females. The bulk of the instances had multiple stones, and biochemical research revealed

that most of the stones were mixed varieties. Early screening and detection are assisted by upper abdominal ultrasonography. The preferred course of action is an early cholecystectomy.

### References

1. Rakesh, Rajender G. A prospective clinicopathological study of 50 cases of chronic calculous chole-cystitis in the local population. JEMDS 2013 August ;2(15) : 6706-6716.
2. Dr.R.Thamilselvi, Dr.Pammysinha, Dr. P.M. Subramaniam, Dr. P. G. Konapur, Dr.C.V.Prabha. A clinicopathological study of chole-cystitis with special reference to analysis of chole-lithiasis. International journal of basic medical sciences July 2011;2(2):68-72.
3. Pradhan SB, Joshi MR, Vaidya A. Prevalence of different types of gallstone in the patients with chole-lithiasis at kathmandu medical college, Nepal. Kathmandu university medical journal 2009; Vol.7: 268-271.
4. Malhotra SL. Epidemiological study of chole-lithiasis among railroad workers in India with special reference to causation. Gut 1968; 9[3]: 290 -
5. H.Mohan, R.P.S Punia, S.B. Dhawan, S.Ahal , M.S.Sekhon. Departments of Pathology and Surgery, Government Medical College and Hospital, Chandigarh, India. Morphological spectrum of gallstone disease in 1100 cholecystectomies in north India. Indian journal of surgery 2005; 67(3):P. 140-
6. Mathur SK, Duhan A, Singh S, Aggarwal M, Aggarwal G, Sen R et al. Correlation of gallstone characteristics with mucosal changes in gall-bladder. Tropical gastroenterology 2012 ;33(1):39-44
7. Kamran tassadque, Muhammadali, abdussalam, Muhammedl atif, Nazishafroze, Samrahmasood. Studies on the chemical composition and presentation of gallstones in relation to sex and age among human population of Multan, Pakistan. Journal of biological sciences 2004; 4(4): 470-473.
8. P.Chandran, N. K. Kuchhal, P. Garg and C.S. Pundir. An extended chemical analysis of gallstones. Indian journal of clinical biochemistry 2007; 22 (2): 145-150.
9. Mohammed A. Taher.Descriptive study of chole-lithiasis with chemical constituents analysis of gallstones from patients living in Baghdad, Iraq. International journal of medicine and medical sciences 2013; 5(1): 19-23.
10. Mustafa mazlum, Fatma Hüsniyedilek, Arzu Neşeyener, Çiğdemtokyol, Fatmaaktepe, Osman Nuridilek. Profile of gallbladder diseases diagnosed at Afyonkocatepe University: A retrospective study. Turkish journal of pathology 2011; 27(1): 023-03.