

Exploring the Clinical Signs of Cholelithiasis and How They Relate to Histological Results

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Conflict of interest: Nil

Abstract

Background: One of the most common gastrointestinal 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 & 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 investigation was an observational, prospective, hospital-based study that examined patient gall bladder samples who had already received a cholelithiasis 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. 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/m² 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 investigation, the gallstones ranged in size from 0.2 to 3 cm, with the majority measuring 0.2 cm (25%). In our investigation, chronic nonspecific cholecystitis was the most prevalent lesion, occurring in 80% of cases. The most frequent types of stones in patients with chronic nonspecific cholecystitis were mixed stones (71%). In follicular cholecystitis, pigment stones were common (8%); in xanthogranulomatous cholecystitis, both pigment and cholesterol stones were present (1%).

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

Keywords: cholelithiasis, multiple stones, biochemical analysis, cholecystectomy, histopathological diagnosis

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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 [1]. One of the most common gastrointestinal ailments and a major financial strain on the healthcare system is gall stone disease [2]. Cholelithiasis 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 [3]. 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. Despite being an adenocarcinoma, it is now widely acknowledged that cholelithiasis is a significant risk factor for enabling the development of gall bladder cancer [4-6]. A frequent digestive surgical illness called cholelithiasis 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 [7]. The presence of proteins in the liver and bile that either encourage or hinder cholesterol crystallization into gallstones constitutes the second factor [8]. 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 [9].

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 investigation was an observational, prospective, hospital-based study carried out in an Indian tertiary care hospital. The study lasted for two years.

The institutional ethical committee approved the study.

Inclusion criteria: Patients who previously had a cholelithiasis clinical diagnosis

Exclusion criteria: Specimens sent with a past diagnosis of cancer and as acalculous cholecystitis.

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/m² 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 ²		
>30	70	35%
<30	130	65%
Diet		
Mixed diet	170	85%
Vegetarian	30	15%

In 55 instances (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 investigation, 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 cholecystitis, was present in 80% of cases.

Table 4: Spectrum of lesions of the gall bladder

Spectrum of lesions of the gall bladder	Percentage of cases
Chronic nonspecific cholecystitis	
Follicular cholecystitis	24%
Xanthogranulomatous	36%
Acute on chronic cholecystitis	21%
Well differentiated adenocarcinoma	13%
Infiltrating papillary carcinoma	4%
Adenosquamous carcinoma	2%

The most frequent types of stones in patients with chronic nonspecific cholecystitis were mixed stones (71%). In follicular cholecystitis, pigment stones were common (8%); in xanthogranulomatous cholecystitis, both

pigment and cholesterol stones were present (1%). In 4% of instances, mixed stones were related to acute or chronic cholecystitis. Both mixed and pigment stones were observed in 3% of the 12 cases of adenocarcinoma each.

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

Diagnosis	Mixed	Pigment stones	Cholesterol stones
Chronic nonspecific cholecystitis	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 [10]. 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. 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 [11]. 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 Tamil Selvi et al., SK Mathur et al. peaked in the fifth decade. According to Tamil selvi et al. and Kamran et al., the most prevalent symptom in our study was pain in the right hypochondrium. In our study, 30% of cases had epigastric pain, compared to only 15.3% in Tamil Selvi et al study. In our study, jaundice was seen in 15% of cases, although Tamil selvi et al. saw it as a presenting feature in just 3.8% of cases [12]. 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 Tamil 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/m² is considered obese, and in our analysis, 35% of cases met this definition, compared to 39% in Tamil 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 Tamil selvi et al. and SK Mathur et al., who also found a higher percentage of multiple stones. This shows that cholecystitis with numerous stones exhibits greater symptoms than cholecystitis with a single stone. In our investigation, 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 Tamil 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 Tamil 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. 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 [13-15]. According to the histopathology of our study's cases, the majority (80%) had chronic nonspecific cholecystitis, which included lymphocytes, plasma cells, histiocytes, and occasionally eosinophils. This finding is in line with research by Mustafa Mazlum et al., SK Mathur et al., and Tamil Selvi et al. In contrast to SK Mathur et al study where follicular and xanthogranulomatous cholecystitis were observed in 5% and 3% of patients respectively, our investigation found that both conditions were present in 8% and 2% of cases, respectively. Infection with gram-negative bacteria can cause follicular cholecystitis, which can lead to stones. Xanthogranulomatous cholecystitis 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 cholecystitis is typically linked to acalculous cholecystitis, which was not included in our study, it was not observed.

In our study, 4% of instances of acute or chronic cholecystitis were seen, whereas SK Mathur et al. reported 12% of cases [16]. In our investigation, gall bladder cancer was observed in 6% of cases. The prior clinical diagnosis of chronic cholecystitis was present in each and every instance. [17] Tamil Selvi et al. and Mustafa Mazlum et al. found a reduced incidence of cancer in comparison to our study. Similar to Mohan et al., chronic non-specific cholecystitis was most frequently linked with mixed stones in 80% of cases. In our investigation, adenocarcinoma was found in 6% of cases and was equally linked with both mixed and pigment stones, but in a study by Mohan et al., carcinoma was found in only 1.09% of cases and was exclusively associated with pigment 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.

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