

A Hospital Based Clinical Features of Cholelithiasis and its Correlation with Histopathological Finding: An Observational Study**Kundan Kumar¹, Rahul Singh², Manish³**¹Senior Resident, Department of General Surgery, Narayan Medical College and Hospital, Sasaram, Bihar, India²Senior Resident, Department of General Surgery, Narayan Medical College and Hospital, Sasaram, Bihar, India³Professor, Department of General Surgery, Narayan Medical College and Hospital, Sasaram, Bihar, India

Received: 08-04-2023 / Revised 06-05-2023 / Accepted 22-06-2023

Corresponding author: Dr. Kundan Kumar

Conflict of interest: Nil

Abstract:**Aim:** The aim of the present study was to assess the clinical features of cholelithiasis and its correlation with histopathological finding.**Material & Methods:** A prospective, observational study, conducted in the Department of General Surgery. Study duration was of 1 year. This study included 200 patients.**Results:** In the present study, majority of the patients belonged to 21-40 years age group followed by 41-60 years age group. There were 65% male and 35% females. Multiple stones were the commonest stones seen in 82% of the cases. On gross- examination, thickness of Gall bladder was increased in 55% of cases. Size of the gallstone varied from 0.2 to 3 cm with maximum number of stones measuring 0.2cm (25%) in our study. Chronic nonspecific cholecystitis was the commonest lesion encountered in our study seen in 80% of cases.**Conclusion:** Cholelithiasis has an increased prevalence in males. Efforts should be taken to reduce all variable risk factors which lead to cholelithiasis. Multiple stones were present in majority of the cases and biochemical analysis showed most of the stones to be of mixed variety. Upper abdominal ultrasound helps in early screening and detection. Early cholecystectomy is the treatment of choice.**Keywords:** Cholelithiasis, Multiple Stones, Biochemical Analysis, Cholecystectomy, Histopathological Diagnosis.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Cholelithiasis is a chronic recurrent disease of the hepatobiliary system. The impaired metabolism of cholesterol, bile acids and bilirubin are thought to be responsible for gallstone formation [1] Cholelithiasis has worldwide prevalence, with estimated incidence of 1.39/100 person/year, varying little between populations. The estimated prevalence of gall stone disease in India has been reported as 2% to 9%. [2] It is 10 times more frequent in North than South India. Dietary deficiencies in the two regions are suspected to be responsible for the difference in the prevalence rate. It is common in females and in advanced age. [3,4] Gall stones are a major cause of morbidity and mortality throughout the world. [5]

The incidence of cholecystitis and cholelithiasis has increased over the past couple of decades throughout the world and is attributed to the increased intake of fatty, high calorie diet and

increased consumption of alcohol. [6,7] Patients with gallstones typically complain of right Hypochondrium or epigastric pain, which may radiate to the back. Other symptoms include dyspepsia, flatulence, food intolerance particularly to fats. [8]

Incomplete and infrequent emptying of the gallbladder may cause the bile to become concentrated and contributes to gallstone formation. [9] Cholelithiasis produces diverse histopathological changes in gallbladder mucosa, namely acute inflammation, chronic inflammation, granulomatous inflammation, hyperplasia, cholesterosis, dysplasia, and carcinoma. [10,11] An abdominal ultrasound is the standard diagnostic test for gallstones. [12] Ultrasonography has estimated sensitivity and specificity of 84% and 99%, being gold-standard for the diagnosis of extra hepatic biliary diseases, detecting gallstones of 1.5-2 mm in diameter. [13]

The prevalence of gallstones is around 4% in India and 10% in the western world. [14] An epidemiological study restricted to rail road workers showed that North Indians have seven times higher incidence of gallstones as compared to South Indians. [15] Examination Survey (NHANES III) has revealed an overall prevalence of gallstones of 7.9% in men and 16.6% in women. [16] Laparoscopic cholecystectomy (LC) has become the gold standard in the treatment of cholelithiasis, with the introduction of LC in France in 1987 and in the USA in 1988. Cholecystectomy is the first treatment option in symptomatic cholelithiasis. Indications for a laparoscopic approach to the gallbladder and biliary tree include symptomatic cholelithiasis, biliary dyskinesia, acute cholecystitis, and complications related to common bile duct stones including pancreatitis with few relative or absolute contraindications. [17]

Hence the aim was to study clinical features of cholelithiasis and its correlation with histopathological findings.

Material & Methods

A prospective, observational study, conducted in the Department of General Surgery, Narayan Medical College and Hospital, Sasaram, Bihar, India. Study duration was of 1 year. This study included 200 patients.

Inclusion Criteria: Patients with prior clinical diagnosis of cholelithiasis

Exclusion Criteria: Specimens sent as acalculous cholecystitis and with prior diagnosis of malignancy

Methodology

Demographic data, clinical details, surgery details were collected for patients selected for study. Cholecystectomy specimens sent were cut open fresh, gallstones removed, labeled with corresponding histopathology number and biochemical analysis of gallstones was done. The specimens were fixed in 10% buffered formalin, minimum of three sections were taken from fundus, body and neck of gall bladder. Tissue was processed by routine histological technique with paraffin embedding and sectioning at 4-micron thickness and stained with hematoxylin and eosin. Biochemical analysis of gallstones was done for cholesterol (Lieberman's Buchard reaction), calcium, oxalates, phosphates and carbonates by standard methods.

Statistical Analysis

Statistical analysis was done using descriptive statistics. Descriptive analysis of data was done by calculating mean, median, mode and standard deviation.

Results

Table 1: Age and gender wise distribution

Age (years)	No/% of patients
≤20	16 (8)
21-40	130 (65)
41-60	48 (24)
61-80	6 (3)
Total	200 (100)
Gender	
Male	130 (65)
Female	70 (35)

In the present study, majority of the patients belonged to 21-40 years age group followed by 41-60 years age group. There were 65% male and 35% females.

Table 2: Gallstones characteristics

Characteristics	N%
Number of gallstones	
Multiple stones	164 (82)
Single stones	36 (18)
Thickness of gallbladder	
>3mm	110 (55)
<3mm	90 (45)
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)
2.0 mm	20 (10)
2.5 mm	30 (15)

Multiple stones were the commonest stones seen in 82% of the cases. On gross- examination, thickness of Gall bladder was increased in 55% of cases. Size of the gallstone varied from 0.2 to 3 cm with maximum number of stones measuring 0.2cm (25%) in our study.

Table 3: Spectrum of lesions of the gall bladder gallbladder

Spectrum of lesions	N%
Chronic nonspecific cholecystitis	160 (80%)
Follicular cholecystitis	16 (8%)
Xanthogranulomatous	4 (2%)
Acute on chronic cholecystitis	8 (4%)
Well differentiated adenocarcinoma	8 (4%)
Infiltrating papillary carcinoma	2 (1%)
Adenosquamous carcinoma	2 (1%)

Chronic nonspecific cholecystitis was the commonest lesion encountered in our study seen in 80% of cases.

Discussion

Cholelithiasis is a common digestive surgical disorder characterized by abdominal pain, nausea, vomiting and jaundice. Incomplete and infrequent emptying of the gallbladder may cause the bile to become concentrated and contributes to gallstone formation. [18] The second factor is the presence of proteins in the liver and bile that either promote or inhibit cholesterol crystallization into gallstones. Increased levels of the hormone estrogen as a result of pregnancy, hormone therapy, or the use of birth control pills, may increase cholesterol levels in bile and also decrease gallbladder movement resulting in gallstone formation. [19]

In the present study, majority of the patients belonged to 21-40 years age group followed by 41-60 years age group which is similar to Mohan et al [20] in which maximum number of cases were in the 4th decade. There were 65% male and 35% females. Multiple stones were the commonest stones seen in 82% of the cases which is similar to Tamil sevi et al and SK Mathur et al [21] who also had increased number of multiple stones. This indicates that cholecystitis with multiple stones are more symptomatic than those with solitary stones. A size of stones in our study varied from 0.2 to 3.0 cm. Stone of the largest size was a solitary cholesterol stone. On gross- examination, thickness of Gall bladder was increased in 55% of cases. Size of the gallstone varied from 0.2 to 3 cm with maximum number of stones measuring 0.2cm (25%) in our study. Chronic nonspecific cholecystitis was the commonest lesion encountered in our study seen in 80% of cases. Follicular cholecystitis occurs in gram negative bacterial infection and may be associated with stones. Xanthogranulomatous cholecystitis occurs due to penetration of bile into the gall bladder wall

from mucosal ulcers or ruptured rokitansky Asch off sinuses along with outflow obstruction by calculi and infection. Eosinophilic cholecystitis was not seen in our study since it is usually associated with acalculous cholecystitis which was excluded from our study. Acute on chronic cholecystitis was seen in 4% of the cases in our study whereas SK Mathur et al [21] had 12% of the cases.

Cholelithiasis represents one of the most frequent medical situations requiring surgical intervention. Frequently, chronic cholecystitis presents a large range of associated lesions such as cholesterosis, muscle hypertrophy, adenomatous proliferation of the mucous glands, metaplasia, hyperplasia, and dysplasia. The last three lesions are unanimously recognized as precursor lesions with cancerous potential. [22] Precancerous changes of gallbladder mucosa are of particular importance for both the clinical and pathological standpoints. Improved diagnostic procedures allow recognizing invasive carcinoma more frequently at early or resectable stage. However, precancerous conditions may be overlooked by a pathologist in the lack of vision of any correlation with gallstone disease.

Conclusion

Cholelithiasis has an increased prevalence in males. Efforts should be taken to reduce all variable risk factors which lead to cholelithiasis. Multiple stones were present in majority of the cases and biochemical analysis showed most of the stones to be of mixed variety. Upper abdominal ultrasound helps in early screening and detection. Early cholecystectomy is the treatment of choice.

References

1. Bansal A, Akhtar M, Bansal AK. A clinical study: prevalence and management of cholelithiasis. *International Surgery Journal*. 2014; 1 (3):134-9.
2. Dr. R. Thamilselvi, Dr. Pammysinha, Dr. P.M. Subramaniam, Dr. P. G. Konapur, Dr. C. V.

- Prabha. A clinicopathological study of cholecystitis with special reference to analysis of cholelithiasis. *International journal of basic medical sciences*. July 2011;2(2):68-72.
3. Maya MCA, Freitas RG, Pitombo MB, Ronay A. Acute cholecystitis: diagnosis and treatment. *Revista Hospital Universitário Pedro Ernesto*. 2009; 8 (1): 52-60.
 4. Shaffer EA. Gallstone disease: Epidemiology of gallbladder stone disease. *Best Pract Res Clin Gastroenterol*. 2006; 20(6): 981-96.
 5. Johnson D, Kaplan M. Pathogenesis and treatment of gallstones. *New Engl J Med*. 1993; 328:412-2
 6. Pani J, Pandey S, Pani S, Geetha G, Mahenderakar M, Katti K. Histological changes in human gall bladder in pathological condition including cholecystitis and cholelithiasis an analytical study. *IOSR J Pharma*. 2013;3(4):1-13.
 7. Pardhan S, Joshi M, Vaidya A. Prevalence of different types of gallstones in the patients with cholelithiasis at Kathmandu Medical College, Nepal. *Kathmandu Univ Med J*. 2009; 7(3): 27:268-71.
 8. Kraag N, Thijs C, Knipschild P. Dyspepsia—How noisy are gallstones? A meta-analysis of epidemiologic studies of biliary pain, dyspeptic symptoms, and food intolerance. *Scand J Gastroenterol*. 1995; 30: 411-421.
 9. Rakesh, Rajender G. A prospective clinicopathological study of 50 cases of chronic calculous cholecystitis in the local population. *JEMDS*. 2013 August; 2(15): 6706-6716.
 10. Njeze GE. Gallstones. *Niger J Surg*. 2013;19: 49-55.
 11. Baidya R, Sigdel B, Baidya NL. Histopathological changes in gallbladder mucosa associated with cholelithiasis. *Journal of pathology of Nepal*. 2012;2(3):224-5.
 12. Trowbridge RL, Rutkowski NK, Shojania KG. Dose this patient have acute cholecystitis?
 13. Stanisic V, Milicevic M, Kocev N, Stojanovic M, Vlaovic D, Babic I, Vucetic N. Prediction of difficulties in laparoscopic cholecystectomy on the base of routinely available parameters in a smaller regional hospital. *European Review for Medical & Pharmacological Sciences*. 2014 Apr 15;18(8).
 14. Munjal YP. *API Textbook of Medicine*. Jaypee Brothers Medical Pub 2012;9th edn: 911.
 15. Tandon RK. Prevalence and type of biliary stones in India. *World Journal of Gastroenterology*. 2000 Sep 15;6(Suppl3):4-5.
 16. Kasper, Fauci, Hauser, et al. *Harrison's principle of internal medicine*, 19th Edition. McGraw Hill Publication. 2012; 2:2076.
 17. Overby DW, Apelgren KN, Richardson W, Fanelli R. SAGES guidelines for the clinical application of laparoscopic biliary tract surgery. *Surgical endoscopy*. 2010 Oct; 24:2368-86.
 18. Rakesh BH, Rajendra GC. A prospective clinicopathological study of 50 cases of chronic calculous cholecystitis in the local population. *Journal of Evolution of Medical and Dental Sciences*. 2013 Sep 2;2(35):6706-17.
 19. Pradhan SB, Joshi MR, Vaidya A. Prevalence of different types of gallstone in the patients with cholelithiasis at Kathmandu Medical College, Nepal. *Kathmandu University Medical Journal (KUMJ)*. 2009 Jul 1;7(27):268-71.
 20. Mohan H, Punia RP, Dhawan SB, Ahal S, Sekhon MS. Morphological spectrum of gallstone disease in 1100 cholecystectomies in North India. *Indian journal of surgery*. 2005 Jun 1;67(3).
 21. Mathur SK, Duhan A, Singh S, Aggarwal M, Aggarwal G, Sen R, Garg S. Correlation of gallstone characteristics with mucosal changes in gall bladder. *Tropical gastroenterology*. 2012 May 8;33(1):39-44.
 22. Johnston DE, Kaplan MM. Pathogenesis and treatment of gallstones. *New England Journal of Medicine*. 1993 Feb 11;328(6):412-21.