

Original research article**A study of gall bladder stones****¹Dr. Sudhakar Sarvepalli, ²Dr. V. Venkatarami Reddy**^{1,2}Department of Surgical Gastroenterology, Sri Venkateshwara Institute of Medical Sciences, Tirupati, Andhra Pradesh, India**Corresponding Author:**

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Abstract

The incidence of cholelithiasis has registered considerable rise in India in recent decades. The diagnosis and management of biliary diseases has become very accurate and easy with the availability of ultrasound, CT Scan, MRI, MRCP. Most of the cases of isolated chronic cholecystitis with cholelithiasis can be managed with minimally invasive surgery (Laparoscopic Cholecystectomy). In this study patients with cholelithiasis who are admitted during April 2020 to Sep 2022 had been taken up for this study and evaluation.

Aim and Objectives: To study the incidence of gallstone disease in relation to age and sex, the effect of diet in the formation of gallstones, the profile of clinical presentations of gallstones, the efficacy of different types of management for gallstone disease, the biochemical composition of gallstones in our patients, complications of gallstones, the associated diseases with gallstones.

Materials and Methods: This study consists of 100 patients with cholelithiasis who were admitted and treated in our department, their thorough history was taken, necessary investigations were done with appropriate management and gall bladder was sent for HPE, gall stones were sent for bio chemical analysis.

Conclusions: The incidence of gallstones was maximum in 4" and 6" decades. There was no significant sex difference in the study group (Ratio Female 526: Male 48%). Non vegetarians tend to have more gallstones than vegetarians. The most common clinical presentation was pain in the night hypochondrium followed by dyspepsia and other symptoms. Ultrasound was the best investigation for diagnosing cholelithiasis. Laparoscopic cholecystectomy is the operation of choice for gall stones. Non operative therapies for gallstones have limited clinical applicability and require further development. Majority of the patients had mixed stones on biochemical analysis of gallstones. The most common complication which we came across was chronic cholecystitis.

Keywords: Gall stones, cholecystitis, bio chemical analysis, histopathological examination

Introduction

Gall bladder is a pear-shaped saccular organ which stores bile. It is also a place for formation and growth of gall stones. The incidence of Gall bladder disease and gallstones is known to be high in the western world. The incidence of cholelithiasis has registered considerable rise in India in recent decades, since the availability of ultrasonography as a diagnostic tool. The possible reason could be due to the change in the dietary habits. Even within India the incidence varies different parts and the incidence in South India is 7 times lesser than that of North India.

The diagnosis and management of biliary diseases has become very accurate and easy with the availability of ultrasound, CT Scan, MRI, MRCP Ultrasonography has become the sheet-anchor in detection of gall stone disease, as it is easily available, quick and reliable. The management of cholelithiasis and its associated biliary pathology is greatly aided by the availability of Endoscopy, Endoscopic Ultrasound, ERCP and Biliary stenting.

Most of the cases of isolated chronic cholecystitis with cholelithiasis can be managed with minimally invasive surgery (Laparoscopic Cholecystectomy). The percentage of patients requiring open cholecystectomy or CBD-exploration is progressively decreasing. In this study patients with cholelithiasis who are admitted during April 2020 to Sep 2022 had been taken up for this study and evaluation.

Aim and Objectives: To study the incidence of gallstone disease in relation to age and sex, the effect of diet in the formation of gallstones, the profile of clinical presentations of gallstones, the efficacy of different types of management for gallstone disease, the biochemical composition of gallstones in our patients, complications of gallstones, the associated diseases with gallstones.

Materials and Methods: This study consists of 100 patients with cholelithiasis who were admitted and treated in our department. Cases who were diagnosed to have cholelithiasis were taken in this study. The

cases included both the sexes and all the age groups.

Methods: The symptoms and signs were analysed. The patients who presented with symptoms of pain in right hypochondrium, epigastrium and dyspeptic symptoms were taken for study. In those patients we carried out investigations like hemogram, Liver function test, serum electrolytes, Renal function test urine routine, ECG, Chest X ray, as a routine. Ultrasound of the abdomen was done in all the cases. CT scan was done in few cases where we suspected complications.

The patients were evaluated for surgery by the anaesthetist, physician and were taken up for surgical treatment. We did laparoscopic cholecystectomy for 95 cases, open cholecystectomy in 4 cases. In one patient who underwent laparoscopic cholecystectomy was converted to open due to frozen calot's triangle. Gall stones were sent for stone analysis.

Procedure: The following characteristics features of stones are noted (color, number, size, shape and texture of the stone). The stone is grinded in a mortar to a powder.

Bilirubin: Add small quantity of the powder to the reagent. Mix well. One drop of 1,2,3,4 from manual test kit is added. Appearance of white precipitate indicates positive for bilirubin.

Calcium: Dissolve the stone powder in N/10 HCl. Add equal volume of ammonia Heat and filter. Divide the filter into 2 parts. To one part add equal volume of sodium acetate and 2 drops of potassium oxalate. Allow it for 10 minutes. Appearance of white precipitate indicates positive for calcium.

Phosphorous: To the other part of the filtrate add equal volume of concentrated nitric acid and boil gently. Add ammonium molybdate solution Appearance of yellow precipitate indicates positive for phosphorus.

Cholesterol: Extract cholesterol by adding chloroform to the stone powder. Heat and few times. To this filtrate add mixture of concentrated sulphuric acid to 1 part and acetic anhydride to 10 parts. Brown changing to deep blue indicates positive for cholesterol. The stones positive for bilirubin and cholesterol with or without calcium and phosphorus were taken as mixed stones. The stones positive only for cholesterol were taken as cholesterol stones. The stones positive for bilirubin or calcium and bilirubin were taken as pigment stones. All the specimens after surgery were sent for histopathological examination.

Observation

Table 1: Age Distribution

Age	No. of Patients	Percentage
1-20	6	6%
21-40	35	35%
41-60	49	49%
61-80	10	10%
Total	100	100%

A total number of 100 patients with cholelithiasis has been analysed. The majority of patients belong to 41-60 age group (49%) followed by 20-40 age group (35%) and by 61-80 age (10%). Six patients were below 20 age group.

Table 2: Sex Distribution

Age	No. of Patients	Percentage
Male	48	48%
Female	52	52%
Total	100	100%

Out of 100 cases 52 cases (52%) were found to be females and 48 cases (48%) were males.

Table 3: Distribution in Diet

Diet	No. of Patients	Percentage
Mixed diet	79	79%
Vegetarian	21	21%
Total	100	100%

The incidences of gallstones were common in our patients consuming mixed diet of 79% (79 cases) and 21% (21 cases) were consuming vegetarian.

Table 4: Clinical Presentation

Clinical Presentation	No. of Patients	Percentage
Pain in RHC	65	65%
Dyspepsia	54	54%
Others	25	25%

The commonest presentation with cholelithiasis was pain in right hypochondrium 65 cases (65%) compared to dyspepsia 54 cases (54%) and 25 cases (25%) presented with other symptoms.

Table 5: Treatment given

Procedure	No. of Patients	Percentage
Lap cholecystectomy	95	95%
Open Cholecystectomy	4	4%
Conversion Lap to open	1	1%
Total	100	100%

In our study of 100 cases, 95 cases (95%) were undergone laparoscopic cholecystectomy, 4 cases (4%) undergone open cholecystectomy Laparoscopy to open cholecystectomy conversion was done in 1 case (1%).

Table 6: Stone Analysis

Type of Stones	No. of Patients	Percentage
Mixed stones	46	46%
Cholesterol stones	29	29%
Pigment stones	25	25%
Total	100	100%

Mixed stones are common in of study 46% followed by pure Mixed stones are common in of study 46% followed by pure cholesterol 29% and pure pigment stones 25%.

Table 7: Histopathological Examination

HPE	No. of Patients	Percentage
Chronic cholecystitis	79	79%
Acute cholecystitis	12	12%
Acute on chronic cholecystitis	5	5%
Empyema	2	2%
Carcinoma of gall bladder	2	2%
total	100	100%

In our study of 100 cases the common complication and histological diagnosis was chronic cholecystitis (79%), followed by acute cholecystitis 12 cases (12%), acute on chronic cholecystitis (12%), empyema (2%) and carcinoma of gall bladder found in two cases (2%).

Table 8: Associated Diseases

Associated Disease	No. of Patients	Percentage
Diabetes	25	25%
Hypertension	10	10%
IHD	2	2%
Ovarian cyst	2	2%
RHD	1	1%
Hydrocele	1	1%

In our study of 100 cases, diabetes mellitus is commonest associated disease (25%) followed by hypertension (10%) ischaemic heart disease (2%), bronchial asthma (2%), ovarian cyst (2%), rheumatic

heart disease (2%), and one of hydrocele.

Discussion

Age Incidence: In our study, the commonest age of presentation was in the 4th and 5th decade (49%) while comparing to the western literature where the prevalence of gallstones increase with advancing years and the presentation is usually in the 5 and 6 decade (25). Similar results consistent with our study was reported by Similar et al (7), Dhar, C et al (9) Ever hart J E et al (10), Acute Oo et al (6) in which the incidence between 40 and 60 yrs was highest. Surprisingly in the last few decades there has been significant rise in gallstones incidence in children (16, 18). In our study 6 cases are below the age group of 20 years (6%).

Sex incidence: The prevalence of gallstones were common in females when compared to males. Similar to the incidence has been reported in the western literature (5, 7, and 24).

Diet: Most studies reported that vegetarians are at low risk for gallstones. In our study of 100 patients, vegetarians were only 21 (21%) compared to non-Vegetarians of 79 patients (79%). Epidemiological studies provide clear evidence that vegetarians are at low risk for gallstones (17) In some trails vans have had only half the risk compared with gallstones risk in those who consume meat (22,23) Research from India found that vegetarians taking a high fat content diet have been reported to have elevated rather than reduced k of gallstones formation (15)

Clinical presentation: The most common clinical presentation of gallstone disease in our 100 patients were pain in right hypochondrium (05%) followed by dyspepsia (64%) and other symptoms (25%). In a study done in Kasturba medical college of 125 patients abdominal pain was 97% and other symptoms were only 3% (21). Similar results were found in a large prospective study in Italy in which gallstones were associated with pain in right hypochondrium (11). Datas suggest that dyspeptic symptoms without any pain are not to be related to gallstones (19) and ordering of an ultrasound in these patients is not warranted. Dyspeptic symptoms such as gas, epigastric discomfort, flatulence, belching were more likely to persist after surgery compared to biliary symptoms (27).

Investigations: Ultrasound is the best modality of investigation in diagnosing cholelithiasis. In our study all the cases were diagnosed with ultrasound only, Ultrasound is 98% sensitivity and specificity in diagnosing cholelithiasis (13). Indeed Japanese worker have described sub types in gall stones on ultrasonography has a very low yield (14), even if gallstones are detected in patient with dyspepsia, this may be incidental. Cholecystectomy may improve the patient's symptoms.

Treatment: Laparoscopic cholecystectomy is the operation of choice for asymptomatic gallstones, symptomatic stones and even in emergency situations. In our study lap chole was done for 95 patients and open cholecystectomy for 4 patients, and in one case lap converted to opens cholecystectomy due to frozen calots triangle (in case of acute cholecystitis). Here the percentage of conversion from Lap to open was 1% whereas the study by Halevy et al from Los Angles has done study of 20 patients and the conversion rate was 3%. Another study by miasnikov et al conversion rate is 6% out of 300 patients. The gold standard in treatment of cholelithiasis is laparoscopic cholecystectomy at present.

Associated Disease: Diabetes mellitus appears to be associated with an increased risk of gallstone disease. In our study, gallstone disease associated with diabetes is 25%. In a case control study compared 336 patients, diabetes was more prevalent in the patients with gallbladder discs (8) Predominately anecdotal evidence suggests that diabetic patients are at an increased risk for the development of gallstones (26). Two possible contributing factors hyper triglycercaemia and autonomic neuropathy leading to biliary stasis du gall bladder hypo motility (12).

Complications due to gall stones: In our study of 100 cases the common complication and histological diagnosis was chronic cholecystitis (79%), followed by acute cholecystitis (12%), empyema (2%) and two cases of carcinoma of gall bladder, in a study of Adnan Bakr et al of 700 patients, the commonest histological finding was chronic cholecystitis (60.1%) followed by acute cholecystitis (9%), Mucocele (2.6%) Empyema (2.1%), perforation (0.3%) and pancreatitis was only 3.5% Chronic cholecystitis was predominant (66.6%) among UK population followed by acute cholecystitis of 20% and other complications were less than 1-2% (Oxford).

Biochemical analysis of stones: Predominantly cholesterol stones account for 75 % of all gallstones in the west (Oxford), Pigment stones are most common in Asia (Oxford). In my study of gallstones mixed stones (46%) were predominant. Pure cholesterol and pure pigment stones 29% and 25% respectively. In a study conducted in kasturba Medical College of 25 cases mixed stones were 14.56% pure cholesterol

stones and pigment stones formed 24% and 20% respectively. The composition of calculi seen in India shows that the pathogenetic mechanisms are likely to be different from the west. This could also account for the difference in incidence in different parts of the country. Whether the diet forms the basis of different types of gallstones remains to be elucidated (20)

Conclusions

In this study of 100 cases of Gallstone disease over a period of months, treated at Sri Venkateswara Institute of Medical Sciences, Tirupathi. we arrived at the following conclusions.

The incidence of gallstones was maximum in 4" and 6" decades There was no significant sex difference in the study group (Ratio Female 526: Male 48%). Non vegetarians tend to have more gallstones than vegetarians the most common clinical presentation was pain in the night hypochondrium followed by dyspepsia and other symptoms Ultrasound was the best investigation for diagnosing cholelithiasis Laparoscopic cholecystectomy is the operation of choice for gall stones Non operative therapies for gallstones have limited clinical applicability and require further development. Majority of the patients had mixed stones on biochemical analysis of gallstones the most common complication which we came across was chronic cholecystitis Diabetes mellitus was most commonly associated with Gall Stone disease in our study.

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