

Original Research Article

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A one-year study of cholelithiasis at a tertiary care hospital of South India

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ABSTRACT

Background: Gall stone disease is a chronic recurrent disease of hepatobiliary system characterised by formation of gall stones due to impaired metabolism of bile acids, cholesterol and bilirubin. The prevalence of cholelithiasis is variable and has been reported as 2-29% in India with differences in interstate and interregions. The objective of the present study was mainly focuses on the total clinical study with surgical management and their outcome.

Methods: A prospective study for a period of one year was done after approval from ethical committee. The socio-demographic factors, clinical history, physical examination, laboratory investigations with ultrasound abdomen were done in all the cases. Surgical repair by Laparoscopic and open cholecystectomy was done.

Results: Females were more predominant with male: female ratio of 1:1.97. Mean age of study population was 34.12 ± 6.2 years and was more common during 5th decade of life. Pain in the hypochondrium was most common sign. Mixed stones were most common and mostly observed in cases of mixed diet. Laparoscopic cholecystectomy was most commonly performed with zero conversion rate. Wound infection was the most common post-operative complication in both the types of repair.

Conclusions: To conclude, from the present study females were more commonly affected by cholelithiasis than males with a ratio of 1:1.97. Females are more prone during fertile age and reasons are multifactorial due to hormones, parity and hormonal contraceptives. Gall stone disease is more common during fourth and fifth decade of life in both males and females. Mixed diet (non-vegetarian) is associated with increased risk of developing gall stones than vegetarian diet.

Keywords: Cholelithiasis, Laparoscopic cholecystectomy, Ultrasound abdomen, Wound infection

INTRODUCTION

Diseases of the gall bladder are one of the important causes of abdominal morbidity which are ignored because of lack of specific signs and symptoms. Gall stone disease is a chronic recurrent disease of hepatobiliary system characterized by formation of gall stones due to impaired metabolism of bile acids, cholesterol and bilirubin. This altered metabolism is associated with formation of calculi in gall bladder, common bile duct and common hepatic duct.¹ Incidence

of gall stone disease is on a rise globally due a vast change in the dietary changes; life style changes associated with high junk diet consumption and increased sedentary life style modifications. The incidence of gall stone disease is reported to be very high in female population than males. Based on the chemical composition 50% of the stones are cholesterol stones followed by mixed and least are pigmented stones. Mixed and pigment stones are very common in south India and cholesterol stones are common in North India. The simple mechanism of formation of stones is super

saturation of constituents in bile surpassing their maximum solubilities.² the prevalence of cholelithiasis is variable and has been reported as 2-29% in India with differences in interstate and interregions. The prevalence was most common among North Indians than south Indians particularly among the people of the coastal region. However recent studies conducted have reported an increasing trend in incidence of gall stone disease even in rural population. This is mainly attributed to westernization and ease of availability of investigation and ultrasound at rural level also.³ 75% of symptomatic patients require or seek medical attention due to episodic pain in the abdomen. Diagnosis of gallstone disease is by clinical examination and proper history combined with appropriate investigation. This is variable from surgeon to surgeon and hospital to hospital. Laparoscopic cholecystectomy is the gold standard for the treatment of symptomatic gall stone disease and other benign conditions of gall bladder.⁴

Due to changes in the incidence of gall stone disease, there is a great need to study its developing incidence, variable presentations due to changes in life style, associated risk factors and clinical presentations. Our present study mainly focuses on the total clinical study with surgical management and their outcome.

METHODS

A prospective cross-sectional study was conducted for a period of one year from January 2016 to December 2016 at a tertiary care hospital of south India. The study was conducted by department of general surgery after approval from the ethical committee of the institution.

Inclusion criteria

- Patients with diagnosed cholelithiasis by ultrasound abdomen
- No previous history of abdominal surgery
- No history of jaundice recently.

Exclusion criteria

- Asymptomatic patients
- Patients not consented for the study
- Patients diagnosed with acalculus cholelithiasis
- Patients with stones in the common bile duct
- Pregnancy

The study included all the patients attending the OPD of general surgery with complaints suggestive of cholelithiasis and who fulfilled the inclusion criteria for the study. The demographic characters, a thorough clinical history, diet history and risk factor history were noted in a separate pre-designed questionnaire form. A thorough clinical examination by a surgeon, necessary laboratory investigations, liver function tests and ultrasound scan of the abdomen was done on all the patients included in the study. A written informed

consent was obtained from all the cases and detailed explanation regarding the surgical procedure and the study was explained.

All the cases were subjected to routine surgical profile and MRCP, ERCP was done in cases only if required. Laparoscopic cholecystectomy was performed on the cases with no contraindications and open cholecystectomy in few cases like obese or previous history of abdominal surgery. After operative procedure the collected gall bladder was sent for histopathological evaluation and gall stones for chemical analysis. All the patients received post-operative antibiotics and post-operative care as per the need. Patients who underwent Laparoscopic repair were discharged on 3rd day after examination and open cases of repair on 7th day unless contraindicated with complications. Patients were advised for regular follow up and dietary instructions until further advice.

Statistical analysis

All the information was entered in a Microsoft excel spread sheet and analyzed. The corrected data was entered in SPSS software version 2.0 for windows 10. Categorical variables were analyzed using Chi Square test.

RESULTS

A total of 95 cases were included in present study and informed written consent was obtained from all the cases. Gall stones were most common during the fourth and fifth decade accounting for 50.53% of cases in the study. The mean age of the study group was 34.12 ± 6.2 years with males around 32.14 ± 8.20 years and females 38.24 ± 10.12 years (Table 1). When compared statistically there was no significant relation with sex in incidence of cholelithiasis in our study. (p value >0.05) Females were more predominant than males. (Males: 33.68% and females: 66.32%) Male to female ratio in the study was 1:1.97 indicating that females were most common cases of cholelithiasis (Figure 1).

Table 1: Distribution of cases by age.

Age (Years)	No. of cases	%
11-20	5	5.26
21-30	15	15.79
31-40	16	16.84
41-50	28	29.47
51-60	20	21.05
>60 years	11	11.58
Total	95	

Pain in the right hypochondrium was the most common presenting symptom in the study (98.95%) followed in order by dyspepsia (82.11%), Nausea and vomiting (54.74%), Flatulence (50.53%), fever and jaundice in

12% of cases in the study. Cases with jaundice were performed MRCP and stones were identified in CBD (Common Bile duct), in cases with cholangitis secondary to gall stones fever was associated with thickness of the gallbladder wall. 79 cases (83.16%) had tenderness in right hypochondrium, 24 cases (25.26%) with Guarding and 15 cases with mass (15.79%) (Table 2).

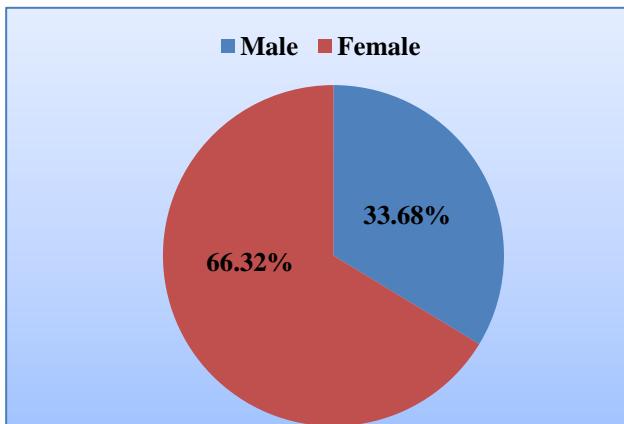


Figure 1: Sex distribution of cases in the study.

Table 2: Distribution of symptoms among the cases in the study.

Symptoms	No. of cases	%
Right hypochondrium pain	94	98.95
Nausea and vomiting	52	54.74
Jaundice	12	12.63
Dyspepsia	78	82.11
Fever	11	11.58
Flatulence	48	50.53
Signs		
Tenderness	79	83.16
Guarding	24	25.26
Mass	15	15.79

All the patients were performed routine laboratory investigations like CBP, LFT and renal function tests. 38 cases were anaemic with Hb% <8gm and altered liver function tests with raised Alkaline phosphatase was observed in a total of 28 cases excluding the cases of clinical jaundice.

However statistically significant correlation was not observed between raised levels of alkaline phosphatase and presence of gall stones in our study (P value >0.05).

Ultrasound abdomen examination of all the cases revealed that of 95 cases in the study, solitary calculus was observed in 35 cases (36.84%) and multiple stones in 60 cases (63.16%). Thickening of the gall bladder wall was observed in 84 cases (88.42%), distended gall bladder in 18 cases (18.95%), mass in gall bladder in 12 cases (12.63%) and stones in CBD and gallbladder in 12 cases (Table 3).

Table 3: Ultrasonography findings among cases in the study.

Findings on ultrasonography	No	%
Mass in gall bladder	12	12.63
Distended gallbladder	18	18.95
Stones in bladder	95	100.00
Solitary calculus	35	36.84
Multiple calculus	60	63.16
Thickening of gall bladder	84	88.42
Stones in CBD	12	12.63

In the present study, cases of acute Cholecystitis were managed preoperatively with antibiotics, nasogastric aspiration, analgesics for 6-8 weeks and then performed surgical repair. In present study, 58 cases (61.05%) underwent laparoscopic cholecystectomy and 37 cases were repaired by open cholecystectomy (38.95%). All the patients were managed post operatively as per the procedure involved and a drain was kept in open cases of repair.

Table 4: Type of operation.

Type of complication	Laparoscopic cholecystectomy (n=58)	Open cholecystectomy (n=37)
Wound infection	4	6
Bile leak	1	3
Retained stone	1	0
Haemorrhage	0	0
Bile duct injury	4	6
Prolonged ileus	1	0
Total	11	15

In 58 cases of laparoscopic cholecystectomy, 4 cases developed post-operative wound infection, 4 cases of bile leak, 1 case of bile duct injury, and 1 case each with prolonged ileus and retained stone. In cases of open cholecystectomy, 6 cases each developed wound infection, bile duct injury and 3 cases of bile leakage.

More complications were observed in cases of open cholecystectomy than laparoscopic repair. When analyzed statistically between the two groups of repairs, significant correlation was observed in development of complications in cases of open cholecystectomy than laparoscopic cholecystectomy (P value <0.05).

In present study, chemical analysis of the stones identified that 89.36% of stones were mixed stones, 8.51% were cholesterol stones and 2.13% were pigmented stones (Figure 2).

Histopathological examination of all the cases revealed that 92% of cases were of chronic Cholecystitis and 8% were of acute Cholecystitis and no malignancy was reported.

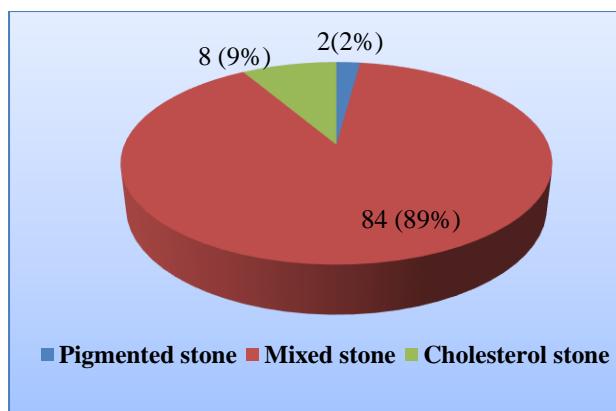


Figure 1: Type of stones analyzed in the study.

DISCUSSION

In the present study, 66.32% of the cases were female and males were 33.68% as similar in the studies of Sharma et al with an incidence of 78% in females and 22% among males.⁵ Peak age incidence in our study was 5th decade and 50% of cases accounting during 4th and 5th decade of life. These findings of our study were on par with many studies universally and similar to the findings of a study conducted in Gangetic basin of India.⁶ The findings of our study with regard to age and sex distribution were also similar to the findings of Reddy BB et al who reported higher incidence of cholelithiasis among females and in females with a peak incidence at 3rd and 5th decade of life. This can be attributed to difference in the life style changes and dietary pattern.⁷

In the present study, the most common presenting symptom was pain in the right hypochondrium followed by dyspepsia. These findings were similar to findings of Singh et al who reported pain as the most common followed by nausea, vomiting and flatulence in his study.⁸ however findings in the study of Sharma et al were in contrast who reported dyspepsia as the most common presenting symptom followed by pain, flatulence and guarding as the most common sign of presentation.⁹ Guarding was the most common presenting symptom in our study which is similar to many studies mentioned earlier.

Ultra-sonogram of abdomen in all the cases of present study observed that solitary calculus was seen in 36.84% and multiple calculi in 63.16% of cases. These finding suggest that multiple calculi are common which is on par with the findings of Sharada et al who reported that incidence of solitary calculus was 47% in her study and multiple calculi was 53%.¹⁰ Domeyer et al in his study observed that solitary calculi were an important factor for inflammation of gall bladder.¹¹ However, few studies reported no statistical significance with number of stones and development of inflammation.

In present study, the incidence of gall stones in cases consuming mixed non-vegetarian diet was 68% and in

vegetarians was 32%, this reflects that increased intake of protein with high energy foods, and saturated sugars with reduced fiber intake are associated with increased gallstone formation. A new discovery of the role of orphan nuclear receptors in the regulation of fatty acid and hepatic cholesterol metabolism and excretion open new perspectives for a better understanding of the role of dietary constituents on cholesterol gallstone formation.¹²

As observed in many studies, mixed stones were the most common type of gallstones (89.36%) followed by cholesterol stones (8.51%) and least were pigmented stones (2.13%). These finding were similar to the findings of Chandran et al who reported the incidence of cholesterol gall stones as 24% and pigmented stones (12%) in his study with maximum of mixed stones. However, Mohan et al in their studies reported maximum incidence of cholesterol stones (87%) in contrary to the findings of our study which can be due to differences in the dietary pattern and other factors.¹³

Laparoscopic cholecystectomy was performed in 61.05% of cases in our study and 38.95% with open cholecystectomy.¹² patients had common bile duct calculus and 8 among them underwent open cholecystectomy with CBD exploration and four of them were found to have multiple calculi. Laparoscopic cholecystectomy is still a gold standard procedure in management of acute and cases of chronic cholecystitis. However, the procedure is safe and economical and associated with few post-operative complications. In our study, 4 cases developed wound infection, 4 cases had a bile duct injury, 1 case with retained stone and 1 with bile leak. These findings were almost on par with findings of Kapoor et al.¹⁴ In present study there were no conversion of cases from laparoscopic to open cholecystectomy and the rate of conversion was zero.

CONCLUSION

To conclude, from the present study females were more commonly affected by cholelithiasis than males with a ratio of 1:1.97. Females are more prone during fertile age and reasons are multifactorial due to hormones, parity and hormonal contraceptives. Gall stone disease is more common during fourth and fifth decade of life in both males and females. Mixed diet (Non-vegetarian) is associated with increased risk of developing gall stones than vegetarian diet. Mixed stones are more common than pigmented and cholesterol stones. Pain in the right hypochondrium, dyspepsia is most common presenting symptoms and guarding was the most common sign. Laparoscopic cholecystectomy is the gold standard in management of gall stones in both acute and chronic cases.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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