



International Journal of Surgery Science

E-ISSN: 2616-3470

P-ISSN: 2616-3462

© Surgery Science

www.surgeryscience.com

2021; 5(2): 257-260

Received: 13-02-2021

Accepted: 15-03-2021

Dr. Sachin Jadhav

Dr. VMGMC, Civil Hospital
Campus, Solapur, Maharashtra,
India

Dr. Ritwik Devidas Jaykar

Dr. VMGMC, Civil Hospital
Campus, Solapur, Maharashtra,
India

Dr. Parvat Kashinath Khade

Dr. VMGMC, Civil Hospital
Campus, Solapur, Maharashtra,
India

Clinical study of cholelithiasis in a tertiary care center

Dr. Sachin Jadhav, Dr. Ritwik Devidas Jaykar and Dr. Parvat Kashinath Khade

DOI: <https://doi.org/10.33545/surgery.2021.v5.i2e.702>

Abstract

Background: A cholelithiasis or a gallstone is a stone formed within the gallbladder out of precipitated bile components. The term cholelithiasis may refer to the presence of gallstones, and choledocholithiasis refers to presence of migrated gallstones within bile ducts. Gallstones form as a result of solids settling out of solution. The major organic solutes in bile are bilirubin, bile salts, phospholipids, and cholesterol.

Methods: This is prospective study of 50 patients diagnosed as having cholelithiasis and after obtaining informed written consent of patient. Patients inclusive are all the patients with diagnosis of cholelithiasis (consecutive 50 patients) admitted in tertiary care hospital.

Results and Conclusions: In present study it is concluded that highest age incidence in the 4th decade; age, female gender obesity and diabetes is the commonest cause, pain is the commonest mode of presentation, laparoscopy cholecystectomy is most common treatment of choice, while suture line infection is most common complication of cholelithiasis.

Keywords: cholelithiasis, choledocholithiasis, gallstones, gallbladder, cholecystectomy

1. Introduction

A cholelithiasis or a gallstones is a stone formed within the gallbladder out of precipitated bile components ^[1]. The term cholelithiasis may refer to the presence of gallstones ^[2], and choledocholithiasis refers to presence of migrated gallstones within bile ducts. Gallstones form as a result of solids settling out of solution. The major organic solutes in bile are bilirubin, bile salts, phospholipids, and cholesterol ^[3]. The prevalence of gallbladder stones varies widely in different parts of the world. In India estimated to be around 4% where as in western world it is 10% ^[4]. It is estimated that at least 20 million persons in the United States have gall stones and that approximately 1 million new cases of cholelithiasis develop each year. Prevalence in Europe is 18.5% from the autopsy with the lowest prevalence from Ireland (5%) and the highest from Sweden (38%). In Australia the prevalence rate varies from 15% to 25%. Highest prevalence in pima Indian tribe of Arizona. With total and female prevalence of 49% and 73% respectively ^[5,6]. Gallstones are rare in Africa with prevalence of less than 1% and in Japan it has been increased from 2% to 7% ^[5].

2. Materials and Methods

Present study was carried out in the department of General Surgery. Dr. VMGMC, SCSMSR general hospital, Solapur. In the present prospective study, total number of surgical patients seen in outpatient department basis of 71752 patients out of which there were 50 cases found. According to these values the incidence of cholelithiasis in our tertiary care center was 0.69%. In this study 50 cases of cholelithiasis were admitted in our tertiary care centre, and after obtaining informed written consent of patient. Patients inclusive are all the patients with diagnosis of cholelithiasis (consecutive 50 patients) admitted in tertiary care hospital. On admission detailed clinical history regarding time of appearance and duration of symptoms were noted. Thorough clinical examination was done. General condition of patient was assessed and noted down. In diagnosis main stress was given on detailed history obtained from patients and following points were noted. The clinical diagnosis of cholelithiasis was ultrasonography, it was clearly showing solitary or multiple gallstones. History and physical examination findings are: Pain was the predominant symptoms in the present study. The commonest site of pain was in the Rt. hypochondrium, and the next commonest site was epigastrium.

Corresponding Author:

Dr. Parvat Kashinath Khade

Dr. VMGMC, Civil Hospital
Campus, Solapur, Maharashtra,
India

Patients complained of pain radiating to the back, chronic recurring pain, acute onset of pain, pain was colicky in nature, dull aching pain, and nausea/vomiting are the signs and symptoms of cholelithiasis in present study. Patients vomiting was spontaneous, occurred mostly during the attack of pain. In the present study patients had jaundice and dyspepsia. The endoscopic examination in these patients did not reveal any pathology. On ultrasound examination, these patients had gallstones. The dyspepsia was relieved after these patients underwent cholecystectomy. Fever was present in the present study and it was secondary to cholecystitis. These investigations are done in every case to rule-out other associated anomalies and to confirm clinical diagnosis according to severity.

3. Results and Discussion

During the period of this study total number of surgical patients seen in our outpatient department basis was 71752 patients out of which there were 50 cases found. This study includes a total of 50 cases that were studied prospectively over a period of 2 years, that were treated as inpatient's basis in our tertiary care center. Well known available literature on cholelithiasis is reviewed. In this study the result of our study is compared with those of well-known authors.

3.1. Distribution of cases by age group

Table 1: Age-wise incidence

Age group (years)	Number of cases	Percentage
11-20	1	2%
21-30	5	10%
31-40	9	18%
41-50	17	34%
51-60	11	22%
61-70	6	12%
>70	1	2%

There is an increased incidence of cholelithiasis in the 4th and 5th decade with the peak in the 4th decade. In my study the youngest patient was 19 years old and the oldest patient is 75 years old.

Table 2: Comparison of age incidence with other studies

Age group (years)	Present study		Suresh S Karlatt <i>et al.</i>	
	No.	%	No.	%
11-20	1	2%	3	2.09%
21-30	5	10%	9	6.29%
31-40	9	18%	29	26.27%
41-50	17	34%	38	26.57%
51-60	11	22%	30	24.48%
61-70	6	12%	20	13.99%
>70	1	2%	9	6.29%

In this study, cases fall between 19 and 75 years. There is an increased incidence in the 4th and 5th decade with the maximum incidence in the 5th decade. Similar incidence is seen in the studies of Suresh S Karlatt *et al.* [7] (4th decade).

3.2. Distribution of cases by sex

Table 3: Gender-wise distribution

Sex	Number of cases	Percentage
Male	20	40%
Female	30	60%
Total	50	100%

In the present study 30 patients were female and 20 patients were male. The present study shows gallstones diseases are a common problem in female population. The female to male ratio is 3:2.

Table 4: Comparison of gender distribution with other studies

Gander	Present study		R Gopi series	
	No.	%	No.	%
Male	20	40	21	39.6%
Female	30	60	32	60.4%
Total	50	100	53	100%

In the present study 30 out of 50 cases were female while the rest 20 were male. R Gopi [8] series showed 60.4% were female, 39.6% were male. Similar sex preponderance in the favor of females were noted by R Gopi *et al* series [8].

3.3. Aetiology of present case

In the present study the most common causative factor's in cholelithiasis was obesity and diabetes. In our study number of cases of obesity were 26 patients, and diabetic patients were 15.

3.4. Presenting signs and symptoms

Table 5: Presenting signs

Signs	Number of cases	Percentage
Tenderness	48	96%
Guarding	15	30%
Mass	5	10%

Tenderness in the Rt. hypochondrium was present in 48 patients, guarding was present in 15 patients. A positive Murphy's sign was present in 7 patients. A mass was felt in 5 patients. The mass could be due to distention of gallbladder with adherent omentum over laying the inflamed gallbladder.

Table 6: Presenting symptoms

Symptoms	Number of cases	Percentage
Pain	49	98%
Nausea/vomiting	28	56%
Jaundice	7	14%
Dyspepsia	12	24%
Fever	4	8%

Table 7: Comparison of presenting symptoms with other studies

Symptoms	Present study		Ganey's series	
	No.	%	No.	%
Pain	49	98	987	95%
Nausea/vomiting	28	56	576	55.6%
Dyspepsia	12	24	101	10%
Jaundice	4	8	222	21%
Fever	4	8	92	9%

Pain was the predominant symptoms in the present study (98%). The commonest site of pain was in the Rt. hypochondrium, and the next commonest site was epigastrium. 5 patients complained of pain radiating to the back. 48 patients had chronic recurring pain, 2 patients had acute onset of pain, pain was colicky in nature. 13 patients had dull aching pain; 33 patients had colicky pain, similar to Ganey series [9]. 56% (28 patients) of cases in the present series had nausea/vomiting. Patient's vomiting was spontaneous, occurred mostly during the attack of pain. Vomiting in this study was similar to Ganey *et al.* series [9]. In

the present study 4 patient had jaundice. The endoscopic examination in these patients did not reveal any pathology. On ultrasound examination, these patients had gallstones.

The dyspepsia was relieved after these patients underwent cholecystectomy. The incidence of dyspepsia in present series was 12 (24%). Fever was present in 4 cases in the present study. Fever was secondary to cholecystitis and cholangitis. The fever occurred as a part of Charcot's triad.

3.5. General physical examination

The 15 patients were moderately built and nourished, 26 patients were obese. These observations are against the time-honored aphorism that fat people are more prone for this disease. 15 patients were diabetic and 8 patients were using oral contraception or hormone therapy. 4 patients suffered from liver diseases related to alcoholism.

3.6. Various investigations

All the patients routine hematological and biochemical investigations were done. The hemoglobin of patients ranged from 8 to 15 gm%. A hemoglobin level of 10 grams was accepted for the surgery. Blood transfusion was given to selected patients to improve the hemoglobin level. 2 cases diagnosed as acute uncontrolled blood sugar level were managed conservatively with IV fluids, nasogastric aspiration, antibiotics, and analgesics. These patients were treated conservatively and were then offered surgery after 6 weeks. Associated medical illness was treated accordingly, before taking the patient to surgery.

Table 8: Comparison of ultrasound findings with other study

Ultrasound findings	Present study		Alok Sharma series	
	No.	%	No.	%
Stones in gallbladder	50	100%	57	98.3%
Solitary stone	12	24%	15	26.3%
Multiple stones	38	76%	42	73.7%
Thickening of gallbladder	5	20%	10	17.2%
Mass	4	2%	1	1.7%
Common bile duct stone	2	4%	Na	Na
Empyema	1	2%	Na	Na

Ultrasound scanning was done in all patients, all the cases revealed stone in the gall bladder. Gall bladder stones were seen in 50 patients. Out of which 12 were solitary stones, 38 were multiple, thickening of gall bladder was seen in 5 patients, mass detected in 4 patients, common bile duct stone was seen in 1 patients and empyema was seen in only one patient. Many of the features in my study were similar to studies of Major Alok Sharma *et al.* [10] During laparoscopic cholecystectomy to conversion to open cholecystectomy was due to big mass of the gallbladder.

3.7. Modalities of treatment

In the present study 42 patients underwent laparoscopic cholecystectomy, 8 patients underwent open cholecystectomy and 4 patients underwent Endoscopic retrograde cholangiopancreatography due to common bile duct injury and bile leak complication.

Table 9: Type of operation

Type of operation	Number of cases	Percentage
Laparoscopic cholecystectomy	42	84%
Open cholecystectomy	8	16%

In the present study 42 patients underwent laparoscopic cholecystectomy, 8 patients underwent open cholecystectomy and 4 patients underwent Endoscopic retrograde cholangiopancreatography for common bile duct injury and bile leak complications.

The conversion rate from lap to open cholecystectomy was 4%. Which was similar to studies of Scott *et al.* [11] (4.3%). The conversion rate was 7% in Schmidt *et al.* [12]

3.8. Operation and duration of hospital stay

Table 10: Operating room time with other studies

Type of operation	Operating room time Present study	Trondsen <i>et al.</i>
Laparoscopic cholecystectomy	45 min	50 min
Open cholecystectomy	90 min	100 min

The operative room time for open cholecystectomy ranged from 65 min to 110 min, with approximate average time being 90 min, and laparoscopic cholecystectomy ranged from 30 min to 70 min, with approximate average time being 45 min. Which were similar to study of Trondsen *et al.* [13] average 50 min for laparoscopic cholecystectomy and average 100 min for open cholecystectomy.

Table 11: Comparison of duration of hospital stay with other studies

Operation	Average length of stay (days)	
	Present study	Trondsen <i>et al.</i>
Open cholecystectomy	7	4
Lap cholecystectomy	3	3

In the present study the average duration of hospital stay were 7 days in open cholecystectomy patients and 3 days in laparoscopic cholecystectomy patients. Similar average duration of hospital stay in open cholecystectomy were 4 days and in laparoscopic cholecystectomy were 3 days according to Trondsen *et al.* [13] respectively.

3.9. Postoperative treatment

All the patients were given IV fluids, Nasogastric aspiration was done, and antibiotics and analgesics were given. Drainage tube was removed between 3 and 5 days based upon the drainage.

3.10. Types of stones

According to book reference 45 patients had mixed type of stones, 4 patients had cholesterol stones and only 1 patient had pigment stone.

3.11. Complications

Table 12: Pre-operative complications

Pre-operative complications	Number of cases	Percentage
Acute cholecystitis	35	70
Chronic cholecystitis	10	20
Empyema of gall bladder	1	2
Mucocoele	1	2
Perforation	0	0
Biliary obstruction	1	2
Acute cholangitis	1	2
Acute pancreatitis	1	2
Intestinal obstruction (gallstone ileus)	0	0

In this study acute and chronic cholecystitis was the most common preoperative complication, which was 35 and 10 patients had acute and chronic cholecystitis. The percentage regarding was to 70% and 20% respectively.

Table 13: Intraoperative complications

Intra operative complication	Laparoscopic cholecystectomy	Open cholecystectomy
Bile duct injury	1	1

Table 14: Postoperative complications

Postoperative complications	Laparoscopic cholecystectomy	Open cholecystectomy	Total
Suture line infection	1	2	3
Hemorrhage	0	0	0
Retained stones	0	0	0
Bile leak	1	1	2
Prolonged ileus	0	0	0

In the present study 3 patients had suture line infection. 2 patient had post-operative bile leak and 2 patients had bile duct injury which was managed by endoscopic retrograde cholangiopancreatography stenting.

In the present study suture line infection was the most common complication, which was seen in 3 patients. The suture line infection rate in the study of Saxena *et al.* was 6.3%. Two patients had bile leak and 2 patients had bile duct injury which was treated by Endoscopic retrograde cholangiopancreatography stenting. In these cases, drain was kept and drain was removed after drain discharged at minimal level or absent.

3.12. Types of stones

Table 15: Gross presentation of gallstones postoperative specimen

Type of stones	Number of cases	Percentage
Cholesterol stones	4	8%
Mixed stones	45	90%
Pigment stones	1	2%

According to book reference 45 patients had mixed type of stones, 4 patients had cholesterol stones and only 1 patient had pigment stone.

3.13. Follow up

There were no complications in the follow up period in any patient. Nothing more can be stated because of limited period of follow up of patients. Patients were advised regarding diet, rest and to visit the surgical OPD for regular follow up for weekly for first month and monthly for next six months.

4. Conclusion

The incidence of gallstones was highest in the 4th and 5th decades of the life with maximum incidence in the 4th decade. Gallstone's disease is more common in female. The common causes of gallstones were age (4th and 5th decade), female gender, obesity and diabetes. The commonest symptom was pain abdomen and the commonest sign was tenderness in the right hypochondrium. Ultrasonography was the investigation of the choice. It showed multiple gallstones in the majority of cases. The conversion rate from laparoscopic cholecystectomy to open cholecystectomy was 4%. Acute cholecystitis and suture line infection were the most common preoperative and postoperative complications in our study. Laparoscopic cholecystectomy

reduced the number of stay in the hospital, pain and disability as compared to open cholecystectomy. The commonest type of the stone was mixed stone.

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