

A Study on Prevalence, Clinical Presentation, and Management of Gall Stone Diseases in Southern Odisha

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ABSTRACT

BACKGROUND

Gallstone disease or cholelithiasis is a significant health problem in both developing and developed nations. It affects 10 % to 15 % of the adult population in western countries. The prevalence of gallbladder stones varies widely in different communities in India with North Indians having 2- to 4-fold higher prevalence as compared with the South Indians. In the present study apart from studying the epidemiology, i.e., demographic factors, dietary habits, clinical presentation, and diagnostic tools, the techniques of laparoscopic and open cholecystectomy are compared and complications after surgery are studied in a rural population in southern Odisha.

METHODS

It is a prospective observational study comprising of 128 patients conducted in the Department of General Surgery, MKCG Medical College, Berhampur, from July 2017 to June 2019. Patients with symptomatic and USG proven gallstones were selected for the study. Also, comparison was made between laparoscopic and open techniques of cholecystectomy.

RESULTS

The female to male ratio of GSD was 2.3:1 with maximum number of patients in the 41 - 50 yrs. age group. 85 patients had laparoscopic cholecystectomy and 39 patients underwent open cholecystectomy. 7 patients had common bile duct stones. The average duration of surgery in laparoscopic cholecystectomy was 44.5 mins while the average duration of surgery in open cholecystectomy was 74.5 mins. The average duration of post-operative pain was 32.5 hours in open cholecystectomy in comparison to 19.4 hours in cases of laparoscopic cholecystectomy.

CONCLUSIONS

Mean age of the patients was 46.76 years with a female-male ratio of 2.3:1. Gallstones are more prevalent in patients consuming a non-vegetarian diet. Laparoscopic cholecystectomy was the preferred technique and was found to be associated with lesser operative time, lower hospital stays, less post-operative pain and better cosmesis.

KEYWORDS

Gallstones, Cholecystitis, Laparoscopic Cholecystectomy.

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BACKGROUND

Gallstone disease (GSD or cholelithiasis) is a significant health problem both in both developing and developed nations. It affects 10 to 15% of the adult population in western countries. They are asymptomatic in the majority of cases (>80 percent). Approximately, 1- 2 per cent of asymptomatic patients will develop symptoms requiring surgery per year, making cholecystectomy one of the most common operations performed by general surgeons.¹

The prevalence of gallbladder stones varies widely in different communities in India, the North Indians having 2- 4 fold higher prevalence as compared with those among South Indians. Furthermore, there is a predominance of cholesterol gallstones among the North Indians. In contrast, South Indians have a predominance of pigment gallstones both in the gallbladder and the CBD.²

There are many researches on aetiology, clinical presentation, management specifically evaluating the modalities of treatment but chemical analysis and bile culture though age old investigations were not given much importance in spite that they could give an insight into pathogenesis and presentation. Incidence in India partially attributed to widespread use of ultrasonography (USG) in the last two decades but changing socio-economic structure and changes in various other epidemiological factors including diet may also be responsible. In the present study apart from studying the epidemiology, i.e., demographic factors, dietary habits, clinical presentation, diagnostic tools, the techniques of laparoscopic and open cholecystectomy are compared and complications after surgery are studied in a rural population in southern Odisha. Where the cases of calculous GB disease are on the rise and pose a significant economic burden on the society.

Medical management of gallstone disease with ursodeoxycholic acid has been generally unsuccessful as with non-operative methods like extra corporeal shock wave lithotripsy (ESWL).

Open cholecystectomy was initially the treatment of choice but the advent of laparoscopic cholecystectomy has gained popularity as it is associated with less morbidity, pain, less hospital stay, better cosmesis and early return to work but it is associated with a long learning curve, expensive instruments and increase chances of bile duct injuries especially in the setting of acute inflammation, abnormal bile duct anomaly, inexperience on the part of the surgeon.

METHODS

This is a prospective observational study conducted in the Department of General Surgery, MKCG Medical College, Berhampur, after obtaining approval by the ethical committee of MKCG Medical College, Berhampur, on human subject's research from July 2017 to June 2019.

Patients with symptomatic "cholelithiasis" like abdominal pain, nausea, dyspepsia, jaundice, pancreatitis with USG detected gallstones alone or gallstones with common bile duct (CBD) stones were included in the study. The patients

who did not give consent to join the study, acalculous cholecystitis or with primary CBD stones. i.e., no calculus in gall bladder, malignant conditions of the GB were excluded from the study.

One hundred twenty-eight patients of clearly documented cases of Gallstone diseases of the Gall bladder and biliary tract admitted in the surgical units of MKCG medical college Hospital between July 2017 to June 2019 (2 years) constitute the material of this study. The survey interviews were conducted in confidential settings using a pretested questionnaire in the local language. The questionnaire was prepared which included socio demographic details such as age, sex, address, occupation, dietary habits and personal history etc.

Relevant preoperative investigations of blood, Urine, Plain X-ray abdomen and USG, LFT, CT scan were done in all possible cases. The operative findings and postoperative complications were recorded and carefully analysed. The Gall bladder specimens of all the cholecystectomy cases were routinely sent for Histopathological examination.

A detailed clinical history and physical examination was carried out and recorded in a standard proforma which included demographic factors (age and gender), dietary status (veg: pure vegetarian, mixed: vegetarian + poultry + meat + eggs), clinical presentation factors, (dyspepsia, acute upper abdomen pain chronic upper abdomen pain, jaundice, nausea/vomiting) and a standardized clinical examination was done which included general physical examination and systemic examination specially looking for tenderness in right hypochondrium, palpable lump in the right hypochondrium and hepatomegaly. The investigations included complete blood count, random blood sugar, liver function test, routine urine examination and USG abdomen.

The patients were categorised into laparoscopic group, open group and those who had common bile duct stones. The comparison between laparoscopic and open cholecystectomy was done on the basis of operative time, post-operative pain, time taken for resumption of oral diet and complications.

RESULTS

The 128 patients of gall stone disease who were studied ranged from 24 to 68 years with a maximum incidence in the age groups 40-50 years. The female to male ratio of incidence of gallstones in our study was 2.3:1. In our study 100 patients (78%) belonged to low socio-economic status group. 90 patients were taking mixed diet while 38 were taking vegetarian diet.

Parity and Obesity

In our study, out of 90 females, the number of multiparous women (2 or more pregnancy) was 73 (57.14%) and nulliparous was 5. Obesity was found to be present in 56 of the 128 patients in the study (44%).

Clinical Presentation

Of the 128 patients studied, Pain over right hypochondrium which was dull aching in nature was seen in 102 patients. Complains of flatulent/dyspepsia especially after heavy or fatty meals was present in 90 patients. 30 patients presented with fever who had acute cholecystitis or perforation. Murphy’s sign was elicited in all 30 patients of acute cholecystitis. Nausea and vomiting were seen in 79 patients while 7 patients presented with obstructive jaundice due to CBD stones. The gallbladder was not palpable in any of these patients (Courvoisier’s law).

Radiological Investigations

Abdominal USG was done in all cases which demonstrated stones in GB in all cases, 14 of them had stones in the common bile duct with dilatation of the common bile duct. 108 patients had multiple GB stones whereas 20 had solitary calculus and 14 patients had concomitant CBD stones.

Management

All 128 cases were taken up for surgery. Out of which 10 patients were taken up for emergency operation turned out to be gallbladder perforation underwent open cholecystectomy. 85 cases underwent lap cholecystectomy whereas 39 cases underwent open cholecystectomy. Out of the 7 cases with obstructive jaundice 4 patients underwent open cholecystectomy with CBD exploration, stones were removed from the CBD and choledochoduodenostomy was done as a diversion and remaining 3 patients underwent ERCP guided gallstone removal and laparoscopic cholecystectomy. All Patients showed improvement in jaundice after the procedure.

Histopathology

Of the 128 operated gall bladder specimens sent for Histopathological examinations, 90 (70%) showed features of chronic cholecystitis, 31 showed features of Acute Cholecystitis and (24%), 7 (6%) showed features of gangrenous cholecystitis.

No associated carcinomatous changes were noted in this series.

Intra-Op Complications

5 Cases which were taken up for laparoscopic cholecystectomy had to be converted to open cholecystectomy due to presence of adhesions and inflammation. Conversion to open rate was 6.32%.

Post-Op Complications

3 patients who had undergone laparoscopic cholecystectomy developed port site infection and patient kept on antibiotic coverage with dressing. 2 cases of biliary leaks were seen, classified as Strasberg type C injury and reoperation and repair was done. 4 patients of open cholecystectomy

developed wound infection, managed with dressing, antibiotics.

Age (Years)	Frequency	Percentage
21-30	10	8
31-40	30	23
41-50	46	36
51-60	22	17
61-70	20	16
TOTAL	128	100

Table 1. Age Incidence of Gallstone Disease

Diet	Frequency	Percentage
Vegetarian	38	30
Mixed diet	90	70
Total	128	100

Table 2. Relationship between Diet and Gallstones

Complains	Frequency	Percentage
Pain Abdomen	102/128	80
Dyspepsia/Flatulence	90/128	70
Fever	30/128	24
Nausea/Vomiting	79/128	60
Jaundice	20/128	16

Table 3. Presenting Complaints of Various Patients

Management	Frequency	Percentage
Open Cholecystectomy	39	30
Lap Cholecystectomy	85	67
Cbd Exploration	4	3
Total	128	100

Table 4. Number of Patients Undergoing Open, Laparoscopic and CBD Exploration

Complications	Frequency	Percentage
Laparoscopic	5/85	5.88
Open	4/39	10.25
Total	9	

Table 5. Overall Complication Rate of Laparoscopic vs Open Cholecystectomy

Operative Time (Mins.)	Laparoscopic (79)	Open (35)
<40	5	0
41-50	34	0
51-60	25	7
61-70	15	7
71-80	0	21

Table 6. Operative Times for Laparoscopic and Open Cholecystectomy

Average Duration of Hospital Stay

The average duration of hospital stay for laparoscopic cholecystectomy was 4.5 days. The average duration of hospital stay for open cholecystectomy was 7.3 days. The average durations of hospital stay for open cholecystectomy with CBD exploration was 11.5 days. So laparoscopic cholecystectomy was associated with less.

Operative Time

The average duration of surgery in laparoscopic cholecystectomy was (40-55 mins) 44.5 (mean) mins while the average duration of surgery in open cholecystectomy was 74.5 mins (55-80 mins)

Post-Operative Pain & Feeding

The average duration of post-operative pain was 32.5 hours in open cholecystectomy in comparison to 19.4 hours in cases of laparoscopic cholecystectomy. Early resumption of diet was possible in laparoscopic group within 2 days (average 1.2 days) whereas in open group it was 2.4 days.

DISCUSSION

In the present study, (90) 70% cases were females, while the rest (38) 30% cases were males. Selvi et al showed 38.5% males and 61.5% females were patients of cholelithiasis.³

Another study that researched oestrogen receptors and cholesterol biosynthesis found that oestrogen in particular stimulated the HMG-Co-A reductase enzyme causing increased synthesis of cholesterol and thus putting women at an increased risk of supersaturation. Further supporting the link between oestrogen and gallstones, it was determined that postmenopausal women on oestrogen replacement therapy were found to have an increased incidence of gallstones. Progesterone may also contribute to gall stone disease by inhibiting gallbladder contraction and promoting hypomotility and gallbladder stasis.

Our study showed that 108 (84%) patients had multiple calculi, 20 (16%) solitary calculi and 14 (11%) had CBD stones. While a study done in Haryana by Chandran et al showed 76% as multiple stones.⁴ Jenna P, Kodi S⁵ found in a similar study that chronic cholecystitis was the most common presentation of gallstones at 76%. In our study also, the number of patients with chronic cholecystitis was 70% and 24% with acute cholecystitis and 6% with perforated/ gangrenous cholecystitis. In this study, 70% (90) Patients consumed a mixed diet (predominantly non-vegetarian diet) and the rest 30% (38) patients consumed a vegetarian. The findings were similar with the findings in a study done by Maskey et al. in 1990 AD in Nepal where incidence of cholelithiasis was found more frequently among the people who consumed more fat and protein.⁶

Several studies that have evaluated the role of diet as a potential risk factor for gallstone formation, including energy intake, cholesterol, fatty acids, fibre, carbohydrates, vitamins and minerals, and alcohol intake. The association between cholesterol intake and gallstone disease has been variable in different studies. Recent discoveries 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. We observed that 102 (80%) patients had pain abdomen as presenting complain similar result were found by Ganey et al and Sharma.^{7,8} In our study the number of multiparous females (more than 2 children) was 20 (57.14%) and nulliparous was 5. In a similar study Selvi et al found the number of multiparous females in the study to be 53.14 % and obesity at 39%.³

In our study 85 patients had laparoscopic cholecystectomy and 39 patients underwent open

cholecystectomy. 4 patients with CBD stones underwent open cholecystectomy with CBD exploration and remaining 3 underwent ERCP and stone removal with laparoscopic cholecystectomy. Post op wound infection with laparoscopic cholecystectomy was 3.8 % (3/79), whereas for open was at 10%. Karim T et al reported wound infections in open to be 3 times that of lap cholecystectomy.⁹ The average duration of surgery in laparoscopic cholecystectomy was (40-55 mins) 44.5 (mean) mins while the average duration of surgery in open cholecystectomy was 74.5 mins (55-80 mins). Similar findings were reported by Singh et al (72.4 vs 44.7) for open vs lap cholecystectomy.¹⁰

The average duration of post-operative pain was 32.5 hours in open cholecystectomy in comparison to 19.4 hours in cases of laparoscopic cholecystectomy. In a similar study by Singh et al duration of postoperative pain was 18.3 hours in LC Group and 30.7 hours in OC Group.¹⁰ Shukla A et al duration of postoperative pain was 14.68 hours in LC Group and 27.92 hours in OC Group.¹¹ Early resumption of diet was possible in laparoscopic group within 2 days (average 1.2 days) whereas in open group it was 2.4 days. Singh et al reported it as 2.1 Days and 1.2 days respectively for OC and LC respectively.¹⁰

The average duration of stay for laparoscopic cholecystectomy was 4.5 days and for open was 7.3 days and 11.5 days for patients undergoing CBD exploration. Jenna P, Kodi S in a similar study found the average duration of stay as 4 days for laparoscopic and 9 days for open cholecystectomy.⁵ Laparoscopic cholecystectomy is a viable and safe procedure even in most cases of acute cholecystitis but the conversion rate may be high. The risk of bile duct injuries is higher and the operation time longer than in elective laparoscopic cholecystectomy. Factors associated with the need to convert and injuries may be abnormal biliary tract anatomy, duration of right upper abdominal pain and severity of the inflammatory process, inadequate surgeon experience. Several studies demonstrated that the risk of conversion depends mainly on the degree of inflammation, pathology of gallbladder disease (e.g. thickness of gallbladder wall), and age and CBD diameter. The number of cases converted from laparoscopic to open technique was 5 out of 79 cases taken up for laparoscopic intervention (6.32%). The conversion was primarily due to which done due to obscured calot's triangle anatomy or dense adhesion and failure to dissect Gall bladder. In a similar study by Meena A et al found the conversion rate to be 9%.¹²

CONCLUSIONS

The mean age of the patients was 46.76 years with a female-male ratio of 2.3:1. Gallstones are more prevalent in patients consuming a non-vegetarian diet. In females, the incidence of gallstones was seen more in multiparous and obese individuals. The age group most commonly affected was found to be 41 - 50 yrs. Pain, flatulence and nausea / vomiting are the major clinical presentation of the gall stone. Wound infection was more predominant in open

cholecystectomy group than the other procedure. Laparoscopic cholecystectomy was the preferred technique and was found to be associated with lesser operative time, lower hospital stays, less post-operative pain and better cosmesis.

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