



Prevalence and Management of Cholelithiasis in Population of Rajasthan: A Clinical Study

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Abstract

Background: Cholelithiasis, is a recurrent disease caused due to impaired cholesterol, bilirubin and bile acid metabolism. It has high prevalence in southern part of India than in comparison to northern part. Therefore the aim of our study was to study the incidence of cholelithiasis in Population of Rajasthan and its associated risk factors along with surgical management and complication.

Materials & Methods: The study was conducted in the department of surgery, Government Bangur Hospital, Pali, Rajasthan (India) taking 80 patients. Patient history was taken in the structured proforma. The ultrasonography of the abdomen and surgical procedure (Both laparoscopy and open) were carried out.

Results: Cholelithiasis was more prevalent in female (68.75%) and was frequent in the age group and 40-50 years (31.25%). Mixed type of calculi was more common (66.25%). The major sign observed was abdominal pain nausea and vomiting. The common site of cholelithiasis was gall bladder (93.75%) and most of the cases were subjected to laparoscopic procedure (90%). We found surgical site infection and biliary leaks as the post-surgical complications.

Conclusion: Prevalence of cholelithiasis is substantially increased due to the changes in life style and eating habits of people considering the associated risk factors, care must be taken in order to reduce the economic as well as health loss.

Keywords: Cholelithiasis, Laparoscopy, Cholesterol Stone, Calculi.

Introduction

Cholelithiasis or gallbladder stone disease, one of the primary root of abdominal morbidity and mortality^[1], is a chronic recurrent disease of hepatobiliary tract caused by impairment in the cholesterol, bile salt and bilirubin metabolism. It is featured with gall stone formation either in hepatic bile duct or common bile duct or gall bladder^[2].

Cholelithiasis may be diagnosed incidentally or in the form of silent stones via ultrasound, however sometimes it may be associated with cholecystitis and cholangitis^[3]. About 50-70% of the cholelithiasis cases are asymptomatic and their conversion to symptomatic cases is very low accounting for 10-25%^[4].

Epidemiological studies have elucidated the influence of the genetic factor in the development

of gall stones. It has been confirmed that gene effects on incontinentia pigmenti chromosomes lead to the calculi development. Further patients having ABCBII mutations are more susceptible to cholelithiasis^[5].

Gall stones are categorized into 3 types namely mixed stones, pigmented stones and cholesterol stones, with mixed type being more common^[6]. Cholesterol stones are formed when bile consists of higher amount of cholesterol and bilirubin with decreased level of bile salts^[7]. Pigmented stones may be either black or brown. Black stones are seen in hemolytic disorder or cirrhosis while brown stones develop in infection of biliary tract caused by liver flukes^[8]

The prevalence of cholelithiasis in Asian countries ranges from 5-20% while it is 10% in western countries^[9]. In India, it is about 4%^[8], with more incidence rate in northern part followed by southern and western part. Eastern part has prevalence similar to the northern part^[9].

The prevalence of cholelithiasis is associated with increased age and female gender. About 30% of women at the age of 65 develop gall stones while the rate increases to 60% at the age of 80. Females have three times higher risk of gall stones compared to males^[10].

Through the management of gall stones has become much easier due to the advent of Lapchole, there is increased risk of morbidity and mortality as well as the prevalence rate, attributed to high calorie and fat intake, decreased fibre consumption and sedentary life style. Thus the aim of this study was to study the prevalence and associated factor such as demographic (age, gender), dietary habits) life style, clinical signs treatment modalities and complications of gall bladder stones in the Population of Rajasthan.

Materials and Methods

The study was conducted in the department of surgery, Government Bangur Hospital, Pali, Rajasthan (India) taking 80 patients of confirm case of cholelithiasis.

Inclusion Criteria

- Patients with calculus in gall bladder alone or in common bile duct

Exclusion Criteria

- Patients who were not interested to participate in the study
- Patients with no calculus in gall bladder

Before the commencement of study, ethical clearance from the institute and written consent form the patients were taken. A structured proforma that consisted details of parameters like demographic factors (age, gender) dietary habits (vegetarian or mixed), clinical signs (abdominal pain, dyspepsia, nausea, vomiting, fever and jaundice) etc was prepared to maintain the detailed record of patient history and examination. The stones removed via surgery were analyzed chemically.

Results

Table 1: Gender wise distribution patients

Gender	N%	Ratio
Male	25 (31.25%)	5:11
Female	55 (68.75%)	

Table 2: Age wise distribution of patients

Age	N (%)
10-20	3 (3.75%)
20-30	7 (8.75%)
30-40	20 (25%)
40-50	25 (31.25%)
50-60	17 (21.25%)
>60	8 (10%)

Table 3: Clinical Presentations (Distributions of patients according to clinical presentation)

Sign	N (%)
Upper Abdominal Pain (Chronic)	57 (71.25%)
Upper Abdominal Pain (Accute)	23 (28.75%)
Dyspepsia/ Flatulence	44 (55%)
Nausea/ Vomiting	53 (66.25%)
Jaundice	6 (7.25%)
Fever	11 (13.75%)

Table 4: Distributions of patients according to site of calculus

Site	N (%)
Gall bladder	75 (93.75%)
Common bile duct	5 (6.25%)

Table 5: Distributions of patients according to types of gall stones

Type	N (%)
Mixed	53 (66.25%)
Pigmented	19 (23.75%)
Cholesterol	8 (10%)

Table 6: Distributions of patients according to dietary habits and types of gall stones

Diet	N (%)	Mixed	Pigmented	Cholesterol
Vegetarian	16 (20%)	8 (50%)	6 (37.5%)	2(12.5%)
Mixed	64 (80%)	29 (45.3%)	18 (28.1%)	17 (26.6%)

Table 7: Nature of the calculus according to USC findings

	N (%)
Solitary Calculus	31 (38.75%)
Multiple Calculus	49 (61.25%)
CBD	5 (6.25%)

Table 8: Types of solitary and multiple calculus

Calculus	Mixed	Pigmented	Cholesterol
Solitary	15(48.4)	11 (35.5)	5 (16.1)
Multiple	23 (46.9)	17 (34.7)	9 (18.4)

Table 9: Treatment modalities for the patients

Treatment	N (%)
Laprosopic Cholecystectomy	72 (90%)
Open cholecystectomy	8 (10%)

Table 10: Post-operative complications shown by patients

Complications	Surgery	
	Laprosopic (72)	Open (8)
Surgical Site Infection	3 (4.16%)	1 (12.5%)
Biliary Leak	3 (4.16%)	-

In this study we found that 68.75% of females had cholelithiasis compared to 31.25% in males with the male female ratio of 5:11. The prevalence of gall stones disease was high in the age group of 40-50 (31.25%) followed by 30-40 (25%) and 50-60 (21.25%)

All the patients had upper abdominal pain of which 71.25% had chronic and 28.75% acute abdominal pain while 55%, 66.25%, 7.25% and 13.75 and of patients had dyspepsia and flatulence, nausea or vomiting, jaundice and fever

respectively. When calculi were analyzed on the basis of external appearance 66.25% of patients consisted mixed stone, followed by pigmented and cholesterol stones in 23.75% and 10% of patients respectively.

Among the patients consuming vegetarian diet and non-vegetarian diet mixed stone was found to be more common 50% and 45.3% respectively. The major site of cholelithiasis was gall bladder (93.75%), followed by common bile duct (6.25%). Abdominal ultrasonographic showed that 38.75% of patients had solitary calculus while multiple calculus was seen in 61.25% of cases. It was also seen that 5 patients had CBD calculus. Of 38.75% of patients having solitary calculus, 48.4%, 35.5% and 16.1% patients respectively had mixed, pigmented and cholesterol type stones respectively, while 61.25% of patients with multiple calculus, it was respectively, 46.9%, 34.7% and 18.4%.

All the 80 patients included in this study underwent surgery of which 90% had laparoscopic cholecystectomy while 10% had open cholecystectomy. As far as post-operative complications were considered 3 each out of 72 (90%) patients undergoing laparoscopic techniques had surgical site infection and biliary leak while 1 out of 8 (10%) of patients undergoing open cholecystectomy had surgical site wound infection.

Discussion

Our study showed 31.25% of males and 68.75% of females had cholelithiasis. The frequency was higher in females. Our result were in accordance with that of Bansal A et al^[9] whose study showed 65% of cases of cholelithiasis to be females and rest 35% to be males. Similar results were obtained in the study of Battacharya et al in which 71.4% of patients with cholelithiasis^[11]. Further Sharma et al^[12] and Thamil et al^[13] showed the prevalence to be 70% and 75% in females while in males it was 30% and 20.5% respectively.

Females at their fertile years are at higher risk of gall stones because of changes in hormonal

profiles. Estrogen increases cholesterol secretion and decreases that of bile salts while progesterone reduces the secretion of bile salts, all of which contribute towards the emptying of gallbladder and leading stasis^[14].

Gall stones disease is more frequent at 4th, 5th and 6th decade of life. In this study the prevalence of gall stones disease was high in the age group of 40-50 years (31.25%), followed by that in 30-40 years (25%) and 50-60 years (21.25%). According to Huang J et al age wise prevalence of gall stones disease was 0.7-1.5%, 2.6%, 6-8%, 11.9% and 10-16% for the age groups of <40, 40-49, 50-59, 60-69 and above 65 respectively^[15].

About 71.25% of patients in our study were presented with chronic abdominal pain while 28.75% had acute abdominal pain. Further 55%, 66.25%, 7.25% and 13.75% of patients had dyspepsia (and flatulence), nausea or vomiting, jaundice and fever respectively. This result was supported by study of Bansal A et al who demonstrated chronic abdominal pain, acute abdominal pain, dyspepsia, nausea or vomiting and jaundice in 71.1%, 28.9%, 62.8%, 64.4% & 71% of patients respectively^[9].

The stones removed after surgery were analyzed externally and we found that 66.25% of the stones to be mixed indicating mixed type of stones to be most frequently occurring stones in cholelithiasis compared to pigmented (23.75%) and cholesterol stones (10%).

In contrast to our result, two Haryana based study, conducted by Chandran et al^[16] and Pundir et al^[17], showed the occurrence of mixed, pigmented and cholesterol stones were shown to be 26%, 38% and 14.2%, 68.6%, 17.2% of cases respectively indicating pigmented type of gall stones to be more common. Bansal et al^[9] and Mohan et al^[18] also confirmed the higher incidence of pigmented type of calculi in gall stones disease.

In our study we found 31 (38.75%) solitary stones and 49 (61.25%) multiple stones. Of 31 solitary calculi, 15 (48.4%) were mixed, 11 (35.5%) were pigmented and 5 (16.1%) were cholesterol stones. Similarly of 49 multiple calculi 23 (46.9%), 17

(34.7%) and 9 (18.4%) were respectively mixed, pigmented and cholesterol stones. According to Vitetta et al^[19] & Hsing et al^[20] multiple stones are more frequently seen in the patients with gall bladder carcinoma.

As far as dietary habits were concerned, 20% of our patients were vegetarians and 80% consumed mixed diet. This shows that cholelithiasis is more common in the patients consuming non vegetarian diet. In both the groups (vegetarian and mixed diet), the occurrence of mixed type of calculi was found to be higher.

The high incidence rate in non-vegetarians may be due to high intake of protein and fat and this fact was further confirmed by the study of Maskey et al who showed higher frequency of gall stones among people who consumed more proteins and fat in their diet^[14].

Recent study have explored that orphan nuclear receptors are involved in hepatic regulation of fatty acid and cholesterol, thus providing a light on their role in gallstones formation and association with dietary habits^[21].

All the patients included in our study underwent surgery. 90% of the patients had laparoscopic cholecystectomy while 10% had open cholecystectomy. Laparoscopic cholecystectomy is a safe and desirable surgical method for most of the cholelithiasis cases, however the conversion rate to open cholecystectomy may be 32% or more depending upon the inflammation degree, gall bladder pathology, age, gender and common bile duct diameter^[22].

Bansal A et al^[9] showed conversion rate to be 9.6 while Schlumpf et al showed it to be 7%^[23].

Conclusion

From this study we can conclude that cholelithiasis is more prevalent among females. The individuals at 4th and 5th decades of there are more susceptible to have the disorder. Mixed type of stone occurs more commonly than cholesterol and pigmented stones. The incisions of stone is more often in non vegetarians. Common clinical signs include abdominal pain, nausea/vomiting,

fever, jaundice while post surgical complication that can occur may be in open cholecystectomy group than the other procedure surgical site infection and biliary leaks. Laparoscopic cholecystectomy is better than surgical treatment than open procedures.

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