# **Original Research Article**

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# A study of gall stone disease from a tertiary care center of Madhya Pradesh, India

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## **ABSTRACT**

**Background:** Gall stone precipitation is multifactorial in nature. Nowadays, gallbladder disease is a frequent problem in developed countries including India, representing a major health problem. The present study was planned to study the epidemiology of gall stone disease in the region of Madhya Pradesh, India.

**Methods:** A retrospective cohort of patients seeking surgical care for their gall stone disease during past one year at Sukhsagar Medical College, Jabalpur, Madhya Pradesh, India during formed the study population. Study tools were records of the patients such as information from MRD department and records from histopathological section.

**Results:** Majority (26.6%) of cases was in the age group of 51-60 years followed by 21.6% cases in the age group of 41-50 years. Sex wise 63.3% were females. Most (71.7%) patients presented with the complaints of pain in the region of hypochondrial region followed by nausea in 46.6%. Jaundice was the least common presenting feature shown by 6.6% patients. As per gross morphology, majority of cases (44) had pigmented stones. As per biochemical analysis, majority of cases (33) had mixed type of stones. The gall stones size varied from 0.2 cm to 2.2 cm in diameter. The weight of gall stones ranged from 0.34 gm to 4.9 gm.

**Conclusions:** Cholelithiasis is more common in the age group of 41- 60 years with female predominance. Nonvegetarians are at risk for cholelithiasis compared to vegetarians. Hypochondrial pain is most common manifestation. Chronic cholecystitis was the most common histopathological diagnosis. Mixed type stones were common variety.

**Keywords:** Diet, Epidemiology, Gall stone disease, Histopathology, Symptoms

#### INTRODUCTION

Diseases of the gallbladder are common and costly. Gallstone disease is a chronic recurrent hepatobiliary disease, the basis for which is the impaired metabolism of cholesterol, bilirubin and bile acids, which is characterized by the formation of gallstones in the hepatic bile duct, common bile duct, or gallbladder. I Gallstone

disease remains one of the major causes of abdominal morbidity and mortality through the world.<sup>2</sup> Nowadays, gallbladder disease is a frequent problem in developed countries including India, representing a major health problem.<sup>3</sup>

Gallstone disease and cardiovascular disease, common diseases world-wide, are strongly associated and have

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considerable economical impact.<sup>4</sup> Intermediate prevalence rates occur in Asian populations (5-20%) and Black Americans (13.9% of women and 13.9% of men). Prevalence of cholelithiasis in India is more in females than males.<sup>5</sup>

Gall stone precipitation is multifactorial in nature. These factors vary across different terrains. Only a very few studies have been conducted on this topic and none from the state of Madhya Pradesh, India. Paucity of literature also warrants this study. Therefore the present study was planned to study the epidemiology of gall stone disease in the region of Madhya Pradesh, India.

### **METHODS**

The current retrospective study was planned and executed by the Department of General Surgery in collaboration with Department of Pathology, Sukhsagar Medical Jabalpur, Madhya Pradesh, India. College, retrospective cohort of patients seeking surgical care for their gall stone disease during past one year at this tertiary care centre during formed the study population. In this study, all the eligible patients who underwent cholecystectomy and specimens were subjected to analysis in pathology laboratory were included in the study. The data were collected retrospectively and included patient characteristics like age and sex wise distribution, type of stone, pattern of presentation etc. During the study period a total of 73 patients visited this tertiary care center but data of 13 patients was discarded from the analysis because it was found incomplete while data cleaning. Thus finally data of 60 patients was analyzed.

Study tools were records of the patients such as information from MRD department and records from histopathological section i.e. histopathological requisition forms and clinical case sheets. Clinical data and pathological data were reviewed. All cholecystectomy specimens received, were fixed in 10% formalin, submitted to detailed gross examination and microscopy after hematoxylin and eosin staining. Sections were obtained from the fundus, body and neck of the gallbladder. The stones were powdered using a mortar and dissolved in different solvents depending on the type of chemical constituent to be analyzed. Permission of Institutional ethics committee (IEC) was sought before the commencement of the study. All the proforma were manually checked and edited for completeness and consistency and were then coded for computer entry. After compilation of collected data, analysis was done using Statistical Package for Social Sciences (SPSS), version 20 (IBM, Chicago, USA). The results were expressed using appropriate statistical methods.

#### **RESULTS**

Data of 60 patients was analyzed in this study. Majority (n = 16, 26.6%) of cases were in the age group of 51-60

years followed by 21.6% cases in the age group of 41-50 years (Table 1). Cholelithiasis was more common among non-vegetarians.

Table 1: Age wise distribution of study subjects.

Age group (years)	Total	Percentage
Equal to or < 20	1	1.6
21-30	12	20
31-40	12	20
41-50	13	21.6
51-60	16	26.6
>61	6	10
Total	60	100

Sex wise out of 60, 38 (63.3%) were females and rest were males (Figure 1).

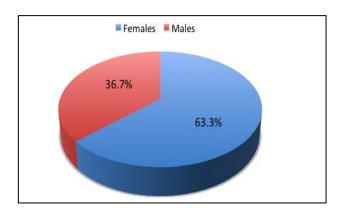


Figure 1: Pie chart showing sex wise distribution of study subjects.

Most (43, 71.7%) patients presented with the complaints of pain in the region of hypochondrial region followed by nausea in 46.6%. Jaundice was the least common presenting feature shown by 6.6% patients (Table 2).

Table 2: Pattern of presentation of study subjects\*.

Pattern of presentation	N	Percentage
Epigastric pain	25	41.6
Right hypochondrial pain	43	71.7
Nausea	28	46.6
Vomiting	23	38.3
Jaundice	4	6.6

<sup>\*</sup>Multiple responses permitted

The stones are divided into 3 groups depending upon their color, varied from yellow and white stones identified as cholesterol stones, dark brown and black as pigment stones and brownish yellow or green as mixed stones.

As per gross morphology, majority of cases (44) had pigmented stones. On the other hand, as per biochemical analysis, majority of cases (33) had mixed type of stones.

(Table 3) The gall stones size varied from 0.2 cm to 2.2 cm in diameter. The weight of gall stones ranged from 0.34 gm to 4.9 gm. There were 45 cases of chronic cholecystitis, the highest incidence of these being in the age group 51-60 years. 6 patients had acute cholecystitis. Other lesions noted were granulomatous cholecystitis,

empyema and carcinoma- one in each group. Eosinophilic cholecystitis was noted in 5 patients. On gross examination of gallbladder, outer surface was found congested in 4 patients, increased wall thickness in 37 patients and polyp in 1 patient.

Table 3: Distribution of gall stones as per their morphology.

Type of stone	Morphology	No of cases as per gross morphology	Number of cases as per biochemical analysis
Cholesterol	Solitary, oval, large and yellow	9	4
Pigment	Multiple, small, jet black and mulberry shape	44	23
Mixed	Multiple, multifaceted an size varies	7	33

#### **DISCUSSION**

The prevalence was more common in Northern Indians than Southern Indians followed by Maharashtra particularly form coastal region. Incidence in India partially attributed to widespread use of ultrasonography (USG) in the last two decades but changing socioeconomic structure and changes in various other epidemiological factors including diet may also be responsible.

The stones form due to imbalance or change in the composition of bile. The first factor that predisposes to stone formation is how often and how well the gallbladder contracts; incomplete and infrequent emptying of the gallbladder may cause the bile to become over-concentrated and contribute to gallstone formation. The second important factor is the presence of proteins in the liver and bile that either promote or inhibit cholesterol crystallization into gallstones. Increased levels of the hormone estrogen as a result of pregnancy, hormone therapy, or the use of birth control pills, may increase cholesterol levels in bile and also decrease gallbladder movement, resulting in gallstone formation. Other factors are parity, smoking, alcohol, diabetes and overweight.<sup>8</sup>

In this study we observed that majority (n = 16, 26.6%) of cases were in the age group of 51 - 60 years followed by 21.6% cases in the age group of 41 - 50 years. Maskey CP et al found that the commonest age group for cholelithiasis was below 30 years comprising 37.5%.

In this study we observed that sex wise out of 60, 38 (63.3%) were females and rest were males. A study carried out by Sharma showed that 30% were male and 70% were female10 and Thamil S et al. showed 20.5% males and 79.5% females were patients of cholelithiasis. 11 The female gender has a most compelling association with gallstone disease, especially during the fertile years. Women are almost twice as likely as men to form stones; the gap narrows following menopause after

which men begin to catch up.<sup>12</sup> The underlying mechanism is female sex hormones; parity, oral contraceptive use and estrogen replacement therapy are established risk factors for cholesterol gallstone formation.<sup>9</sup> Female sex hormones adversely influence hepatic bile secretion and gallbladder function. Estrogens increase cholesterol secretion and diminish bile salt secretion, while progestins act by reducing bile salt secretion and impairing gallbladder emptying leading to stasis.<sup>13</sup>

In this study, as per gross morphology, majority of cases (44) had pigmented stones. On the other hand, as per biochemical analysis, majority of cases (33) had mixed type of stones. While a study done in Haryana by Chandran et al. showed 26%, 38% and 36%, respectively. Mixed and pigment stones are common in northern India. <sup>2</sup>

We observed that most (43, 71.7%) patients presented with the complaints of pain in the region of hypochondrial region followed by nausea in 46.6%. Jaundice was the least common presenting feature shown by 6.6% patients. Similar results were observed by Sharma et al.<sup>14</sup> Vomiting was spontaneous and occurred mostly during the attacks of pain this was also seen by Ganey et al.<sup>15</sup>

Numerous studies that have assessed the role of diet as a potential risk factor for gallstone formation, including energy intake, cholesterol, fatty acids, fiber, carbohydrates, vitamins and minerals, and alcohol intake. 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. <sup>16</sup>

## CONCLUSION

On the basis of findings of this study it can be concluded that cholelithiasis is more common in the age group of 41- 60 years with female predominance. Non-vegetarians are at risk for cholelithiasis compared to vegetarians. Hypochondrial pain is most common manifestation. Chronic cholecystitis was the most common histopathological diagnosis. Mixed type stones were common variety.

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institutional ethics committee

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