

Original Article

PREVELANCE OF GALLSTONE IN WESTERN UTTARPRADESH POPULATION

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ABSTRACT

Gall stone disease is a common health problem requiring cholecystectomy. Gallstone afflicts 10% to 20% of adult populations in developed countries. It is known to produce diverse histopathological changes in the gallbladder mucosa. The aim of the present study is to estimate the types of gallstones according to their shape and number of gallstones and its association with age and sex. In this study the age of patients varies between 17 to 70 years of age. There were 22 males and 109 females (M: F ratio of 1:4.9). In our study we found that multiple stones are present in maximum numbers 66.41%, followed by single stones 24.43%, and double stones are 9.16% cases. The maximum percentage of cases had mixed type of gallstones 66.41%, followed by cholesterol types 29%, pigment type 10.69%, and combined types in 0.76% cases.

KEYWORDS : Gallbladder, Cholecystectomy, Cholelithiasis, Bile.

INTRODUCTION

Gallstones are the most common biliary pathology making cholecystectomy the most common abdominal surgery throughout the world. Gallstones are hard; pebble like deposits in the gallbladder. The word cholelithiasis derived from the greek word. (chol = bile , lith = stone and iasis = process). Gallstones generally form because the bile is saturated with either cholesterol or bilirubin then bile undergoes supersaturation, nucleation and precipitation of cholesterol monohydrate crystals and growth to stone-size aggregation [1]. Initially there is always the formation of a biliary sludge which containing mucus gel, hydrophobic bile pigment, cholesterol- lecithin liquid crystals and solid cholesterol monohydrate crystals. The basic constituents being cholesterol, calcium bilirubinate and calcium carbonate. Gallstones can be divided into the following types:

1. Cholesterol stones- are single to multiple, large (2- 3 cm long), spheroidal to oval in shape and vary from light yellow to dark green or brown to bluish white in color with having a tiny, dark, central spot. They are soft with smooth surfaces.

2. Pigment stones- are multiple, small (2-5 mm) and brown to jet black (dark) in color. They are soft and amorphous with rough surfaces.

3. Mixed gallstones- are usually multiple, faceted, laminated and vary in size & numbers. They presents rough surface with laminated cross section.

4. Combined gallstones- are characteristically large and single. They may have a pure nucleus with a mixed shell or pure shell with a mixed nucleus. Barrel stones, a type of combined stone, are usually two in number, large and faceted on one surface and the thick walled gallbladder is closely wrapped around them.

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Pathophysiology -

Cholesterol gallstone primarily develops when bile contains too much cholesterol and not enough bile salts. Incomplete and infrequent emptying of the gallbladder may cause the bile to become over concentrated and contribute to gallstone formation. This can be caused by high resistance to the flow of bile out of the gallbladder due to the complicated internal geometry of the cystic duct [2].

The presence of proteins in the liver and bile that either promote or inhibit cholesterol crystallization into gallstones may act as secondary factor for the formation of gall stone. In addition, increased levels of the hormone estrogen, as a result of pregnancy or hormone therapy, or the use of combined (estrogen-containing) forms of hormonal contraception, may increase cholesterol levels in bile and also decrease gallbladder contraction, resulting in gallstone formation.

Sequential cholecystographic studies and carbon-14 dating suggest that gallbladder stone grow at a rate of approximately 1-2 mm/ year and that they are usually present for 5-20 years before they are removed [3].

MATERIALS AND METHOD

It is a Cross-sectional hospital based study, carried out at one time point or over a short period, usually conducted to estimate the parameters of interest for a given population, commonly for the purposes of public health planning.

The duration of this study is 2 years extending from January 2014 to January 2016. In total 131 open cholecistectomy specimens with complete gallstones were obtained from the Department of Anatomy Santosh Medical College and Hospital Ghaziabad and Department of Pathology LLRM Medical College and Hospital Meerut.

We included male and female patients of all the age group. Patient of cholelithiasis diagnosed by radiology & recommended for cholecystectomy formed the study population. Autolysed cholecystectomy specimen & cholecystectomy specimen without gallstone were excluded from this study.

OBSERVATIONS

Table 1: Presence of gallstones in relation to age

Age of patient (years)	Number of patient	Percentage
11-20	6	4.58 %
21-30	40	30.53 %
31-40	39	29.77 %
41-50	32	24.43 %
51-60	9	6.87 %
61-70	5	3.82 %

Table 2: Presence of gallstones in relation to sex & religion

Sex	Population	Number of patient
Male (22) 16.79%	Hindu	14
	Muslim	8
Female (109) 83.21%	Hindu	69
	Muslim	40

Table 3: Types of gallstone in relation to their appearance

Types of gallstone	Number of patient	Percentage
Cholesterol	29	22.14 %
Pigmented	14	10.69 %
Mixed	87	66.41 %
Combined	1	0.76 %

In our study we found that the age of patients varies between 17 to 70 years with maximum number of cases 40/131(30.53%) being between 21-30 years and second maximum number of cases were found between 31-40 years of age, these are 39/131(29.77%) (Table-1). There were 22 males and 109 females with M: F ratio of 1:4.9 (Fig.2), among these there were 83 hindus and 48 muslims (Table-2). In our study we found that multiple stones are present in maximum numbers (66.41%), followed by

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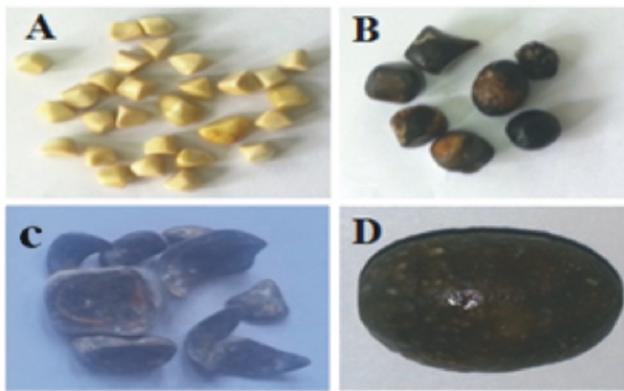


Figure 1: A-Cholesterol stones, B-Pigmented stone, C-Mixed stone, D-Combined stone

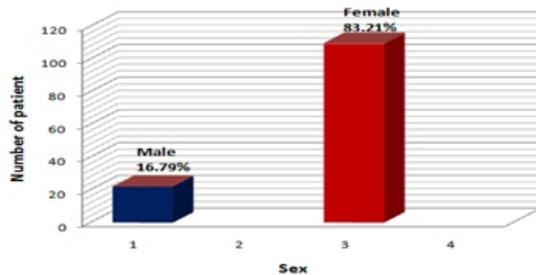


Figure 2: Bar chart showing gallstones in relation to sex

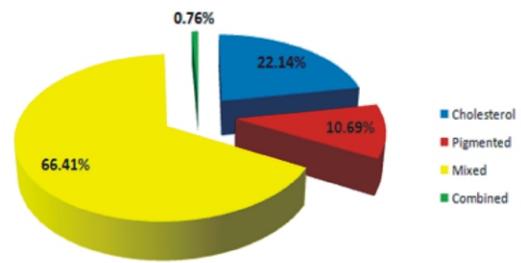


Figure 3: Pie chart showing types of gallstone

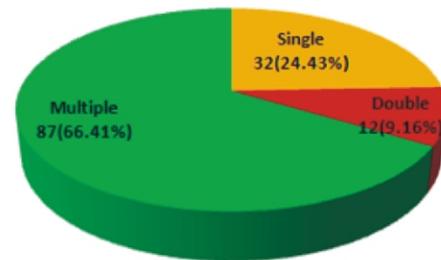


Figure 4: Pie chart showing number of gall stones

single stones (24.43%) and double stones (9.16%) (Fig.4). On the basis of morphological analysis a

Table4: Comparative chart showing the prevalence of gallstone.

Parameters		Present study (2014-16)	Zahrani (2001)	Mohan (2005)	Khanna (2006)	Byna (2013)	Khan (2014)	Narang (2014)	Mathur (2012)	Goyal (2014)	Baig (2002)	Chandran (2007)
Vulnerable age (years)		21-30	36	31-40	42.5	41-60	-	-	-	-	-	-
Sex	Male	16.79%	18%	-	17.14%	41.67%	21%	12%	-	-	-	-
	Female	83.21%	82%	-	82.86%	58.32%	79%	88%	-	-	-	-
	M:F Ratio	1:4.95	1:4.6	-	1:4.8	1:4.8	1:4.7	1:7.3	-	-	-	-
Types of gall-stones	Cholesterol	22.14%	-	17.3	-	-	-	7.03%	7%	5.43%	10%	26%
	Pigmented	10.69%	-	3.2%	-	-	-	1.62%	9%	5.75%	20%	36%
	Mixed	66.61%	-	62.3%	-	-	-	90.8%	59%	68.05%	70%	38%
	Combined	0.76%	-	14%	-	-	-	0.54%	25%	20.76%	-	-
Number of gall-stones	Single	24.43%	-	-	-	16.66%	-	-	39.6%	30.35%		
	Double	9.16%	-	-	-	-	-	-	8.8%	-		
	Multiple	66.41%	-	-	-	83.33%	-	-	51.6%	69.64%		
Number of gall-stones	Single	24.43%	-	-	-	-	16.66%	16.65%	-	-	-	-
	Double	9.16%	-	-	-	-	-	-	-	-	-	-
	Multiple	66.41%	-	-	-	-	83.33%	83.33%	-	-	-	-

maximum percentage of cases had mixed type of gallstones (66.41%), followed by cholesterol types (29%), pigment type (10.69%), and combined types (0.76%) (Table- 3) (Fig.3).

DISCUSSION

In our study the maximum number of patients are in the age group of 21-30 years (40/131cases, 30.53 %), which is similar to Zahrani et al and Mohan et al [4, 5] but contradicts the study of Khanna et al and Byna et al [6, 7](Table- 4). Studies have shown an increase in the prevalence of gallstones with age probably because of decrease in activity of cholesterol reductase and increase in activity of HMG CoA reductase, resulting in increased cholesterol secretion and saturation of bile [8].

In the present study Male to Female ratio is 1: 4.95 (22:109 out of 131 cases), which is in agreement with Zahrani et al (1:4.6), Khanna et al (1:4.8) and Khan et al (1:4.7) [4, 6, 9] but contradictory to Byna et al (1:1.4) and Narang et al (1:7.3) [7, 10] (Table- 4). Other studies have also shown predominance of females among patients with gallstone disease. In fact, female sex hormones and sedentary habits of most women in India expose them to factors that possibly promote the formation of gallstones [11, 12, 13].

With regard to number of gallstones, in our study it was found that multiple gallstones are present in maximum numbers 87/131 (66.41%), followed by single gallstones in 32/131 (24.43%), and double gallstones were present in 12/131(9.16%) cases, which is in agreement with similar other studies also [7, 14, 15] (Table- 4).

In our study the incidence of mixed, cholesterol, pigment, and combined stones are 66.41%, 22.14%, 10.69% and 0.76% respectively, which supports the study of Mohan et al and Narang et al [5, 10], But contradicts the studies of Baig et al and Chandran et al [12, 16] who reported pigmented stone as second most common type of gallstone after mixed one, where as Mathur et al and Goyal et al [14, 15] reported combined stone as the second most common type of gallstone (Table- 4).

CONCLUSION:

The most common type of gallstone occurring in western uttar pradesh region is mixed type, with

maximum number of patients being in the age group of 21-40 years, with a higher risk for females as compared to males, male and female ratio is 1: 4.95. The incidence of multiple gallstones was more as compared to other types. With the advancement of investigational procedures, more cases related to gall bladder pathologies have come to light, thus making it very much relevant to pursue a research in this field. Moreover this study will bring forth to light the knowledge which will be advantageous to the population, as well as medical practioners.

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