

Cholelithiasis Among Patients Who Underwent Abdominal Ultrasound in A Tertiary Hospital of Eastern Nepal

¹Dr. Subaj Bhattarai, ²Dr. Raja Suwal

¹ Assistant Professor, Department of Radiology & Imaging, National Academy of Medical Sciences, Bir Hospital, Kathmandu, Nepal

² Radiologist, Koshi Hospital, Biratnagar, Nepal

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ABSTRACT

Objective: We conducted this retrospective descriptive cross sectional study on cholelithiasis diagnosed on abdominal ultrasonography in a tertiary hospital of eastern Nepal. **Methodology:** Study population consisted of 6278 persons (1381 males & 4897 females) who were examined by abdominal ultrasonography at Koshi Hospital, Biratnagar, Nepal from January 1, 2022 to March 31, 2022. All the patients diagnosed with cholelithiasis were taken from computer record and data was analyzed. **Result:** Cholelithiasis was seen in 101 male and 563 female patients. Frequency of female patients with cholelithiasis was higher (11.5 %) than males (7.3 %). Multiple stones were more commonly seen in both male and female with 67.9 % overall. Large calculi (≥ 5 mm) were seen in 64.9 %. Female patients had large calculi more commonly (67.9 %) than small ones but in male patients, small calculi were seen in slightly higher proportion (51.5 %). Frequency of cholelithiasis was seen increasing with age of patients with maximum (35.8%) participants belonging to age group 51-60 years. **Conclusion:** This study showed prevalence of cholelithiasis was 10.6% with females more commonly affected than males and older age group more affected than the younger one. Multiple gallstones were seen more commonly than single and the most common size of gallstones was larger than 5 mm in diameter.

Key words: Cholelithiasis, Gall bladder, Ultrasonography

INTRODUCTION

Cholelithiasis or gall bladder stone is formed by deposition of crystals in the bileⁱ. Though majority of the cases are asymptomatic and detected incidentally, substantial number of patients have symptoms of right hypochondriac pain. Some patients might suffer from complications like acute calculous cholecystitis, cholangitis, biliary obstruction and abscess formation. Surgery is the definitive treatment and it has huge financial impact to the patients and country as a wholeⁱⁱ.

There are three types of stones in gall bladder- cholesterol stones, pigment stones and mixed stones. Though the composition varies in different population, mixed type stones are most common (78.75%) followed by cholesterol stones (12.5%) and pigment stones (8.75%) in Nepalⁱⁱⁱ. Risk factors for cholelithiasis are many and common ones include female gender, aging, obesity, consumption of oral contraceptive pills, hormone therapy, pregnancy, hypertriglyceridemia, rapid weight loss and metabolic syndrome^{iv}. Overall prevalence of cholelithiasis is found to vary according to population but many studies show it in range of 10-15% on hospital based studies^v. Though most of the cholelithiasis cases are asymptomatic and diagnosed incidentally on ultrasound, few patients may present with right hypochondriac pain, epigastric pain and even fever with or without jaundice if complication (cholecystitis) occurs^{vi}.

Abdominal ultrasonography with curvilinear probe after minimum 6 hours of fasting is the best method for the diagnosis of cholelithiasis. It is widely available, easily accessible, inexpensive and accurate method and is being used as first modality of choice for suspected cases of gallstones. Ultrasonography shows gallstone as hyperechoic round to oval structure within gall bladder with strong posterior acoustic shadow regardless of the composition^{vii}. Other methods to detect gallstones are ultrasonographic endoscopy, magnetic resonance cholangiographic pancreatography (MRCP), endoscopic retrograde cholangiographic pancreatography (ERCP), oral

cholecystogram (OCG), intravenous cholangiogram (IVC), computed tomography scan (CT) etc. All these methods are more expensive and time consuming than abdominal ultrasonography^{viii}.

Asymptomatic cholelithiasis is managed conservatively, however, surgery is the definite treatment method for gallstones. Laparoscopic cholecystectomy is the procedure of choice where gallbladder and stones within it is removed in total. Sphincterotomy can be used to extract stones from gallbladder in some cases. Shock-wave lithotripsy (ESWL) is also used. Though there are few oral medications to dissolve gallstones, their efficacy vary and hence, it could not replace surgery^{ix}.

This study was conducted to determine the prevalence of cholelithiasis in Nepalese population who attended ultrasound clinic of a tertiary care hospital in eastern Nepal. The findings of the study will be useful to estimate the severity of the problems due to gallstone diseases and to explore the needful measures to be taken to reduce its burden throughout the country.

METHODOLOGY

This was a retrospective descriptive cross sectional study conducted at Koshi Hospital, Biratnagar, Morang, Nepal from January 1, 2022 to March 31, 2022. All the patients diagnosed with cholelithiasis on abdominal ultrasound done within the specified time period were taken as samples from the computer record of Department of Radiology, Koshi Hospital. Age and gender of patients were noted. Number of gallstone (single or multiple) and size (diameter) in millimeter were entered in predesigned proforma. Presence or absence of complications like Acute calculous cholecystitis, chronic cholecystitis, cholangitis, dilated biliary tree or abscess were separately noted.

Entry and tabulation of collected data was done in SPSS 20. Data was analyzed to calculate frequency distribution according to age group and gender. Proportion of single or multiple and small (up to 5 mm) or large (>5mm) cholelithiasis were calculated. Association of any complication was analyzed.

RESULTS

Total 6278 cases, found in record, were included in the study. Out of the total sample, 4897 were female (78%) and 1381 were male (22%). Mean age of the study population was 48.3 years. Cholelithiasis was seen in abdominal ultrasonography of 664 patients (10.6 %). Frequency of female patients with cholelithiasis was higher (Table 1) i.e. 11.5 % (563/4897) than male patients which is 7.3 % (101/1381). Multiple stones were more commonly seen in both male and female (Table 2) with 67.9 % overall. Large calculi (≥ 5 mm) were seen in 64.9 % (Table 3). Female patients had large calculi more commonly (67.9 %) than small ones but in male patients, small calculi were seen in slightly higher proportion (51.5 %). Frequency of cholelithiasis was seen increasing with age of patients with maximum (35.8%) participants belonging to age group 51-60 years (Table 4). Less than 1% participants showed complications like acute cholecystitis (2 cases), chronic cholecystitis (2 cases) & cholangitis (1 case).

Table 1: Distribution of cholelithiasis according to gender

Participants	Male	Female	Total
GB calculus present	101	563	664
GB calculus absent	1280	4334	5614
Total	1381	4897	6278

Table 2: Distribution of single and multiple cholelithiasis

GB calculus	Male	Female	Total
Single	42 (41.6%)	171 (30.4%)	213 (32.1%)
Multiple	59 (58.4%)	392 (69.6%)	451 (67.9%)
Total	101	563	664

Table 3: Distribution of small and large cholelithiasis

GB calculus	Male	Female	Total
Small (<5 mm)	52 (51.5%)	181 (32.1%)	233 (35.1%)
Large (>5 mm)	49 (48.5%)	382 (67.9%)	431 (64.9%)
Total	101	563	664

Table 4: Distribution of cholelithiasis in different age groups

Age group	Male	Female	Total
<20 years	2	21	23
21-30 years	5	38	43
31-40 years	12	83	95
41-50 years	15	132	147
51-60 years	40	198	238 (35.8%)
>60 years	27	91	118
Total	101	563	664

Figure 1: Distribution of cholelithiasis in male and female

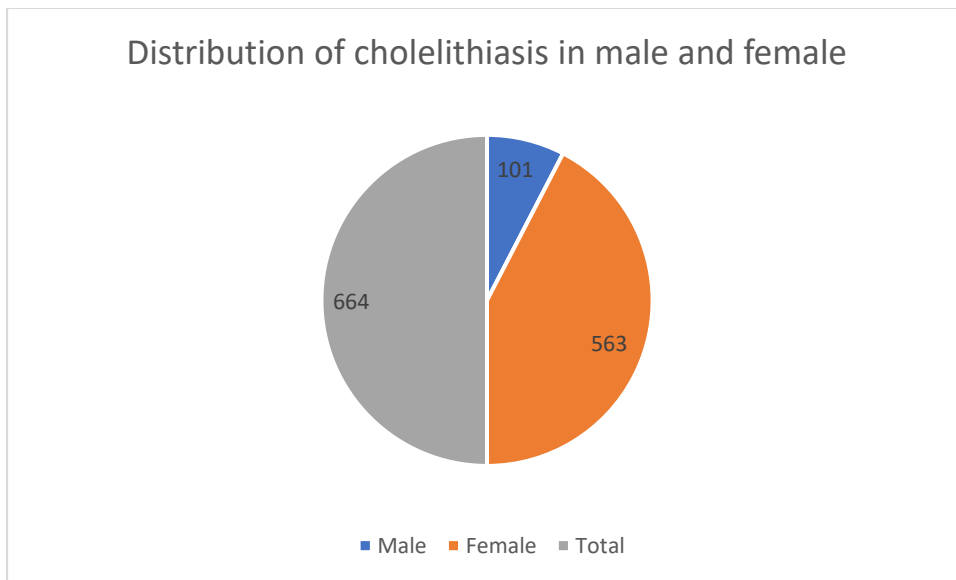
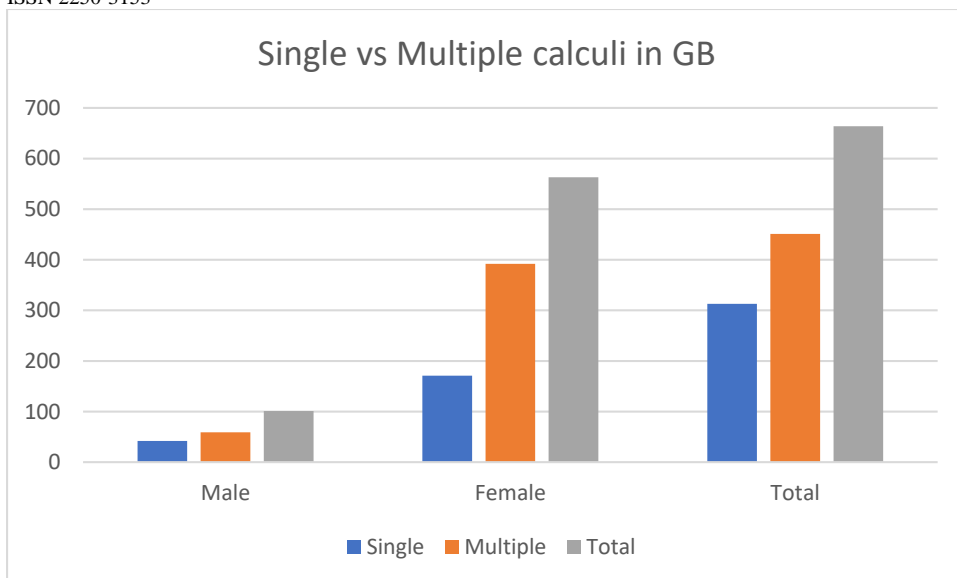


Figure 2: Single vs multiple cholelithiasis in male and female



DISCUSSION

In our hospital based study, the prevalence of cholelithiasis was found to be 10.6 % with significantly higher rate in female (11.5 %) than in male (7.3 %). Similar study done by *Debnath J et al.* in India showed prevalence of 11.6 %^x whereas other studies showed prevalence of 5.2 %^{xi} in Ethiopia by *Getachew A. et al.* and 11.7 %^{xii} in Saudi Arabia by *Abu-Eshy SA et al.* On analysis of different studies, it was seen that prevalence of cholelithiasis varies with population and methodology of study i.e. whether the study is hospital based or community based.

Prevalence of cholelithiasis was seen significantly higher in female gender (11.5 %) than in male (7.3 %) in our study. Similar study done in India by *Debnath J et al.* showed the prevalence of 9.3 % in female and 2.3 % in male. A study done by *Getachew A. et al.* in Ethiopia showed the prevalence of 5.4 % in female and 3.1 % in male. Another study conducted in Saudi Arabia by *Abu-Eshy SA et al.* showed the prevalence of 9.6 % in female and 2.0 % in male. So, almost all studies showed cholelithiasis affected female participants more than male which supports the fact that female gender is an independent risk factor for cholelithiasis.

In our study, the age group having majority of cholelithiasis (35.8%) was 51-60 years old whereas the least number was seen in <20 years of age. A study done by *Getachew A. et al.* in Ethiopia showed the maximum number of cholelithiasis belonged to age group of 65-74 years (8.2%) and minimum number in 15-24 years. It shows older age can be a risk factor for developing cholelithiasis. The difference in age group with maximum number of cholelithiasis in our study might be due to lesser number of patients older than 60 years attending to OPD of our hospital.

Multiple calculi were seen in significantly higher number of cases (67.9%) in our study. A study done in India by *Debnath J et al.* also showed similar finding with 75 % cases having multiple calculi. Another study conducted by *Abu-Eshy SA et al.* in Saudi Arabia showed single cholelithiasis (63.3 %) was more common than multiple cholelithiasis. Such difference in prevalence of multiple or single cholelithiasis in different countries might be due to different food habits of the population.

Our study showed large gallstones (>5 mm in diameter) were more common (64.9%) than small gallstones. However, a study done by *Debnath J et al.* in India showed small gallstones (2-4 mm) were common (37%). This difference in size of common gallstones in different population might be due to food habit and genetic predisposition of the population. Complications were <1% combining all cases of acute cholecystitis, chronic cholecystitis and cholangitis. This finding is similar to other studies^{xiii}.

CONCLUSION

Prevalence of cholelithiasis was 10.6 %. Female gender was more commonly affected than male and the older age group of population was more affected than the younger one. Multiple gallstones were seen more commonly than single and the most common size of

gallstones was larger than 5 mm in diameter. Complications were not common and few to mention are acute calculous cholecystitis, chronic cholecystitis and cholangitis.

CONFLICT OF INTEREST

There was no conflict of interest involved.

LIMITATION

As our study was institution-based, we took sample from patients who came to hospital, so the results may not truly reflect the condition of general population.

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