

## Profile of patients with Gall stone disease - Multi Centre study from Bangladesh

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### Abstract:

**Background:** Cholelithiasis affects between 10% to 15% of people worldwide. As people age, symptomatic cholelithiasis becomes more common and more severe. Presentation is frequently delayed, which increases morbidity, complicates the condition, and delays diagnosis. **Objectives:** The purpose of this study was to evaluate the profile of patients with gall bladder diseases, specially sludge and gallstone. **Methods:** The cross-sectional Observational study was conducted in the outdoor patient of Department of Gastroenterology, Bangabandhu Sheikh Mujib Medical University (BSMMU) and Sylhet Women's Medical College from July 2023 to June 2024. A total of 170 patients with symptomatic gallstone disease were included in the study. Data were collected over a period of 12 months and analyzed by appropriate computer based programmed software Statistical Package for the Social Sciences (SPSS), version 24. **Results:** In this study, most of the patients 64 (37.6%) lies between 41 years to 45 years. Mean  $\pm$  SD of the patients was  $42.2 \pm 7.3$  years. Most of the patients 132 (77.60%) were female and 38 (22.40%) were male. About 83 (48.8%) patients BMI were in between 25.0 – 29.9 kg/m<sup>2</sup>, 32 (18.8%) patients BMI in between 18.5 – 24.9kg/m<sup>2</sup> and 55 (32.4%) of the patients had BMI (>30kg/m<sup>2</sup>). Mean  $\pm$  SD of the study subjects was  $28.13 \pm 3.12$ kg/m<sup>2</sup>. About 26 (15.30%) of the patients were smokers, 139 (81.80%) of the patients were nonsmokers and 5 (2.90%) patients were ex-smoker. Most of the patients 102 (60.00%) came with abdominal pain, apart from this dyspepsia was 17 (10.00%), jaundice was 12 (7.10%), mass in right UQ was 9 (5.30%).USG finding of most of the patients 95 (55.4%) were Multiple stone, 33 (19.4%) had sludge, 31 (18.2%) had single stone, 8 (4.7%) had biliary microlithiasis, 2 (1.2%) had Mass lesion and 1 (0.5%) had polyp. **Conclusion:** Clinical signs and symptoms of gallbladder illnesses are frequently identical; Early detection is important for the treatment of Gall Stone Disease.

**Key words:** Cholelithiasis, Gallbladder diseases, Sludge.

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### I. Introduction:

About 10% to 15% of people worldwide suffer from gallstone disease [1]. The prevalence of gallstone disease in persons over 70 years of age rises from 8% to 50% with age [2]. The highest incidence is seen in women over 70 [3]. As people age, they are more likely to develop gallstone-related problems such as cholecystitis, choledocholithiasis, and biliary pancreatitis [4–6].

Gallbladder emptying is compromised in patients with cholesterol gallstones [7], and they may also exhibit dyspeptic symptoms along with functional abnormalities of the upper and lower gastrointestinal tracts [8-10].

Study recently discovered that individuals with black pigment stones also have a deficit in gallbladder emptying, albeit a less severe one than that of patients with cholesterol stones [8].

Three to six percent of people worldwide contain the gene for  $\beta$ -thalassemia, making it one of the most common single-gene illnesses. In the Mediterranean region, the Middle East, the Indian subcontinent, and the Far East, the illness is a serious public health concern [11]. The development of pigment gallstones requires increased bilirubin synthesis from persistent hemolysis [12,13], and thalassemia major is frequently accompanied by black pigment gallstones [12]. Gallstones did not form in many  $\beta$ -thalassemia major individuals with significant hemolysis, despite identical biochemical and clinical characteristics. Gallstone etiology in  $\beta$ -thalassemia major may be attributed to gallbladder stasis and functional gastrointestinal problems.

The simplest way to describe biliary sludge is as a mixture of bile and particulate matter that happens when bile solutes precipitate [14,15]. Biliary sand, pseudolithiasis, microlithiasis, microcrystalline disease, and biliary sediment are synonyms. Biliary sludge might therefore consist of crystal aggregates or microlithiasis, which are tiny stones scattered throughout a viscous liquid phase that is rich in mucin. These "sandy" precipitates have long been discovered by surgeons in the gallbladders of gallstone sufferers. With the introduction of ultrasonography more than 20 years ago, biliary sludge was first described [16]. Ultrasound is nearly always used to diagnose biliary sludge.

In affluent countries, gallstones are a major health issue that affects 10% to 15% of adults, which means that 20 to 25 million Americans already have or will eventually acquire gallstones [17–19]. Gallbladder disease's resulting direct and indirect costs amount to around \$6.2 billion in the United States each year, making it a significant health burden that has grown by more than 20% over the previous three decades [20, 21]. Gallstone disease is a major cause of hospitalizations for gastrointestinal issues, accounting for an estimated 1.8 million ambulatory care visits annually [22].

## II. Methodology:

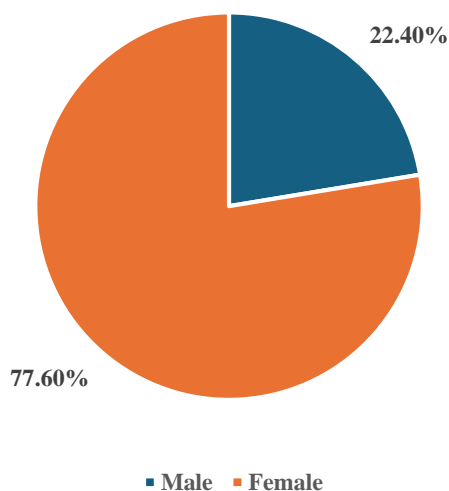
The cross-sectional observational study was conducted in the Outdoor Department of Gastroenterology at Bangabandhu Sheikh Mujib Medical University (BSMMU) and Sylhet Women's Medical College from July 2023 to June 2024, including a total of 170 patients with symptomatic gallstone disease. The inclusion criteria were individuals of both genders, aged 18 years and above, who were clinically diagnosed with gallstones based on ultrasound findings. The exclusion criteria included patients with previous cholecystectomy, those with incomplete medical records, and individuals with other significant abdominal conditions. All patients underwent abdominal ultrasonography to confirm the presence of gallstone disease (GBD). Purposive sampling was used based on the availability of patients who fulfilled the selection criteria. Data were collected through face-to-face interviews using a semi-structured questionnaire, covering details of history, physical examination, and blood investigations. After collection, the data were checked and cleaned, followed by editing, compiling, and categorizing according to the study objectives and variables to detect errors and maintain consistency, relevance, and quality control. Statistical evaluation of the results was conducted using SPSS-24 software.

## III. Result:

**Table I: Distribution of the patients according to age (n = 170)**

Age (years)	Number of cases	%
31 - 35	7	4.1
36 - 40	27	15.9
41 - 45	64	37.6
46 - 50	32	18.8
51 - 55	17	9.8
56 - 60	18	10.6
$\geq 60$	5	2.9
Total	170	100.0
Mean $\pm$ SD: 42.2 $\pm$ 7.3 years		

Table I shows that, most of the patients 64 (37.6%) lies between 41 years to 45 years. Mean  $\pm$  SD of the patients was 42.2  $\pm$  7.3 years.



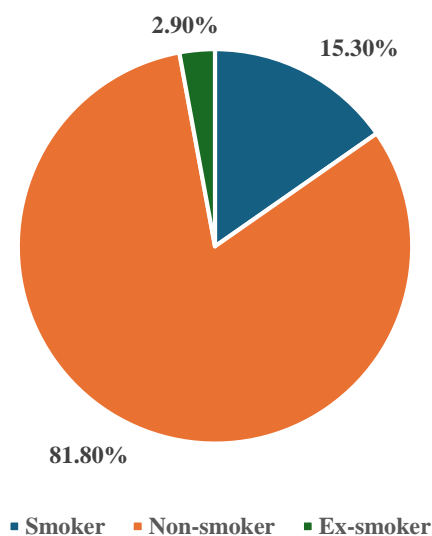
**Figure I: Distribution of the patients according to sex (n=170)**

Figure I shows that, most of the patients 132 (77.60%) were female and 38 (22.40%) were male.

**Table II: Distribution of the patients according to Body Mass Index (n = 170)**

Body Mass Index (kg/m <sup>2</sup> )	Number of cases	%
18.5 – 24.9	32	18.8
25.0 – 29.9	83	48.8
>30	55	32.4
<b>Total</b>	170	100.0
<b>Mean ± SD: 28.13 ± 3.12</b>		

Table II shows that, 83 (48.8%) patients BMI were in between 25.0 – 29.9 kg/m<sup>2</sup>, 32 (18.8%) patients BMI in between 18.5 – 24.9kg/m<sup>2</sup> and 55 (32.4%) of the patients had BMI (>30kg/m<sup>2</sup>). Mean ± SD of the study subjects was 28.13 ± 3.12kg/m<sup>2</sup>



**Figure II: Distribution of patients according to smoking habit (n = 170)**

Figure II shows that, 26 (15.30%) of the patients were smoker, 139 (81.80%) of the patients were nonsmoker and 5 (2.90%) patients were ex-smoker

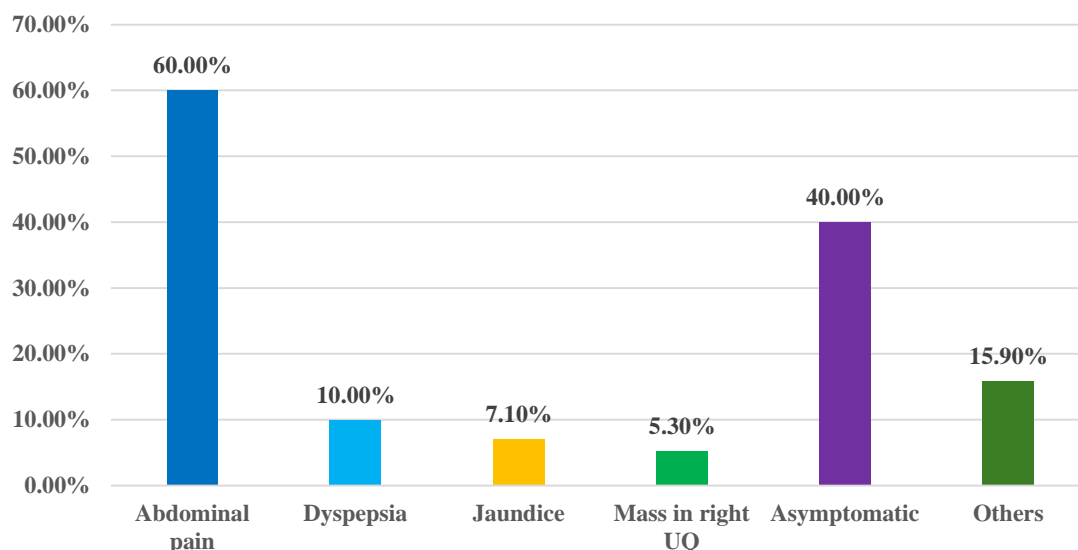


Figure III: Distribution of patients according to Clinical feature (n = 170)

Figure III shows that, most of the patients 102 (60.00%) came with abdominal pain, apart from this dyspepsia was 17 (10.00%), jaundice was 12 (7.10%), mass in right UQ was 9 (5.30%)

Table III: Distribution of the patients according to USG findings (n=170)

USG finding	Number of cases	%
Biliary microlithiasis	8	4.7
Single stone	31	18.2
Multiple stone	95	55.9
Sludge	33	19.4
Mass lesion	2	1.2
Polyp	1	0.5

Table III shows that, USG finding of most of the patients 95 (55.4%) were Multiple stone, 33 (19.4%) had sludge, 31 (18.2%) had single stone, 8 (4.7%) had biliary microlithiasis, 2 (1.2%) had Mass lesion and 1 (0.5%) had polyp

#### IV. Discussion:

Gallstones are easily categorized as cholesterol stones, pigment stones, and mixed stones based on their outward characteristics. Single, spheroidal, coarsely nodular cholesterol stones are translucent, bluish white in color [23]. Pigment gallstones are low in cholesterol and high in pigment substance. Based on their colors, they can be separated into brown and black stones: In contrast to black stones, which are black in color, rigid in consistency, and seem amorphous in cross section, brown stones are soft, brownish yellow, and exhibit alternating dark and light layers [24]. Brown pigment stones generally form in the intrahepatic or extrahepatic bile ducts, while gallstones of the cholesterol and black pigment types form in the GB [25]. It is widely acknowledged that GB stone disease affects women more frequently than it does men. Multiparity [26] or the use of specific medications, such as estrogen and oral contraceptives, may be the cause of the female preponderance [25,27]. Obesity, a diet high in saturated fats and cholesterol, the use of hypolipidemic medications, a sedentary lifestyle, a higher body mass index, a positive family history, and advanced age are additional risk factors that have been proposed [28].

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Other investigations, such as Agrusa et al., Nilesen et al., and Berger et al. reported similar results, with a higher incidence of gallstone disease in females than in males. However, the difference in incidence was smaller than in this study [29,30,31]. Gallstone disease was found to be more common in men than in women in a few investigations, including those by Fukami et al. and Yokota et al. [32,33]. Remarkably, the study's male population had a higher prevalence of simple gallstone illness, but the female group had a higher prevalence of complex gallstone disease. However, men experienced more severe gallstone disease in the Bailey et al. trial. The fact that men are less likely than women to visit hospitals could be one of the explanations they offered for this [34].

The most frequent presenting complaint of patients was abdominal discomfort, typically biliary colic, despite the fact that no prior research comparing the prevalence of symptoms has been found. Skin discoloration that was yellowish was the least frequent complaint. Because the common bile duct's diameter grows with age, gallstones may be able to pass through it more easily without producing jaundice, which is why jaundice is uncommon in the elderly. Due to this, symptoms associated with common bile duct stones were also seen less. Similar results were found in the study by Hu et al. [35].

There was a marginally positive trend toward the patient having pre-diabetes and diabetes, despite the fact that no significant correlation was discovered between the various clinical manifestations of gallstone disease. Diabetes and the incidence of gallstone disease were strongly correlated in earlier research, such as the ten-year prospective study by Lv et al. Wang et al. and Sodhi et al. reported similar findings. Due to a similar set of risk variables, such as obesity and insulin resistance, all of these studies were only able to draw a link rather than demonstrate that diabetes directly causes gallstone disease. By increasing the gallbladder's fasting volume and causing diabetic neuropathy, diabetes is known to reduce the gallbladder's motility in comparison to non-diabetic patients. It also increases the chance of bile stasis and gallstone formation. In this regard, more research can be conducted [36, 37, 38].

In another study, out of 76 patients 75 patients had abdominal ultrasonography, it was discovered that 74 of them had one or more gallstones in their gallbladder. Based on their history, clinical findings, test results, and the presence of a dilated CBD on ultrasound, the single patient in whom no gallstones were discovered on ultrasound was diagnosed with biliary pancreatitis and received abdominal CECT. This patient had ERCP stenting and sludge/stone extraction. When additional assessment of the biliary system anatomy and diagnosis was required, 11 patients also had MRCP. Overall, the results of the MRCP and ultrasonography were quite comparable, however there was a 30% underreporting of the CBD's diameter. This further weakens the use of MRCP in the case of gallstone diseases, where ultrasound can provide major information required to diagnose the disease [39,40].

Gallstones of the cholesterol (mixed and pure) type account for 60% of cases of cholelithiasis, with composite (21%), black-pigmented (8.5%), and brown-pigmented (6.5%) stones following closely behind. Although our study indicated a similar incidence of mixed cholesterol stones, the number of pigmented gallstones was more than double for black and triple for brown [41].

## **V. Conclusion:**

Compared to earlier research based on clinical or necropsy findings, the utilization of ultrasonographic surveys has improved the prevalence of gallbladder disease at any given moment. Important risk variables that are both changeable and unchangeable have been better defined in these population studies. A rise in the number of people with gallstones is predicted by the consequences of shifting environmental risk factors. Gallstone disease is likely to become more common and cause more difficulties due to an aging population, the growing obesity epidemic, and the metabolic syndrome. Cholelithiasis should be prevented by identifying risk factors that can be changed, such as excessive obesity, fast weight reduction, sedentary lifestyle, and important dietary components.

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