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Age, Gender, and BMI Distribution in Cholelithiasis Patients: A Study in Sylhet

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ABSTRACT

Cholelithiasis, a common gastrointestinal condition, is influenced by various factors, including age, gender, BMI, and genetic predisposition. This study aimed to assess the distribution of age, gender and BMI among patients diagnosed with cholelithiasis in Sylhet. A cross-sectional study was conducted from January to June 2022 at Popular Medical Centre and Hospital in Sylhet, involving 200 cholelithiasis patients confirmed through imaging studies. Data were collected through face-to-face interviews, physical examinations, and medical records review. Variables such as age, gender, BMI, the ABO blood group, and family history of gallbladder disease were analysed using descriptive statistics. Among the 200 patients, females (65.5%) were more affected than males (34.5%), with a male-to-female ratio of 1:1.9. The mean age was 45.10±14.30 years, with the highest prevalence in the 48-57 years age group (25.5%). Most patients (50%) had a BMI within the normal range (18.5-24.9), while 46% were underweight (<18.4). Blood group O was predominant (39.5%), followed by B (32%) and A (24%). A positive family history of gallbladder disease was reported by 51% of patients. Cholelithiasis was more prevalent in middle-aged females, with most patients having normal or underweight BMI. Blood group O and a family history of gallbladder disease were significant risk factors. Larger studies with extended follow-ups are needed to confirm these findings.

Keywords: *BMI, Age, Gender, Cholelithiasis.*

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INTRODUCTION

An excessively high concentration of cholesterol or bilirubin in bile in the gallbladder (GB) or biliary system can lead to cholelithiasis, a very common illness[1]. Gallstone disease (GSD), which typically indicates the development of symptoms or difficulties due to gallstones, is an expensive gastrointestinal condition that requires hospitalization[2]. This common digestive tract illness affects about 20% of healthy adults, according to research. The prevalence rates of cholelithiasis in Asian nations vary from 3% to 10%; in particular, recent research has found that the prevalence rates were 3.2% in Japan[2], 10.7% in China[3], 7.1% in North India[4], and 5% in Taiwan[5].

Predominantly, the prevalence of GB disease rises with age. In both sexes, it is more than twice as common in women as in men and reaches around 30% by the time an individual reaches the age of 70[2-8]. There are two types of risk factors for GB disease: 1) modifiable factors and 2) immutable factors. Immutable factors include things like pregnancy, female sex, old age, and ethnicity. One of the main risk factors for gallstone development is obesity.

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Gallstone formation is positively linked with high triglyceride, low high-density lipoprotein (HDL), and high low-density lipoprotein (LDL) levels[9,10]. Furthermore, exercise seems to be preventive since it lowers the chance of cholelithiasis[11,12].

The composition of gallstones shifted from pigment to cholesterol due to diet and lifestyle changes, especially with diet westernisation (increased fat)[13-15]. Globally, the prevalence of obesity is rising, making up the biggest share of risk factors. Additionally, among young male and female adults, both the average body mass index (BMI) and waist size increased between 1979 and 2015[9]. The aim of this study was to determine the frequency of age, gender and BMI distribution among cholelithiasis patient in the Sylhet division.

MATERIALS AND METHODS

The study was carried out during the period of six months from January 2022 to June 2022, in Popular Medical Centre and Hospital, a private hospital in Sylhet, Bangladesh. This study employed a cross-sectional design to assess the frequency of age, gender and BMI among cholelithiasis patients in the Sylhet division. The study population consisted of 200 patients undergoing cholecystectomy, selected through purposive sampling. Participants were included based on a confirmed diagnosis of cholelithiasis as per their medical records, including imaging reports indicating the presence of gallstones. Inclusion criteria encompassed patients aged over 18 years at the time of diagnosis, with comprehensive and accessible medical records containing demographic information, clinical history, laboratory results, and relevant imaging findings related to the diagnosis of cholelithiasis within the predefined period. Exclusion criteria comprised secondary gallstones, patients younger than 18 years, incomplete medical records, treatment influence, and unconfirmed diagnosis. For the investigation reports, imaging studies such as ultrasonography, which confirmed the presence of gallstones, were reviewed. This study examined several variables, chiefly body mass index (BMI), following the World Health Organization (WHO) criteria to establish standardised measurements. BMI was categorised as per the WHO classifications: healthy weight (BMI: 18.5-24.9), overweight (BMI: 25-29.9), and obesity (BMI ≥30)[16]. Ethical issues were maintained properly. Data was analysed with Microsoft Excel. Frequency distribution tables were generated to provide a comprehensive overview of the data, including different age groups, genders, and BMI categories.

RESULTS

Cholelithiasis represents a notable worldwide public health concern characterised by diverse prevalence rates that are impacted by variables including age, gender, body mass index, and familial medical background. Among the 200 participants in this study, 69 (34.5%) were male and 131 (65.5%) were female, resulting in a male-to-female ratio of 1:1.9 (figure-1). Regarding age distribution, the majority of patients (25.5%) belonged to the 48-57 years age group, followed by 28-37 years (23.5%), 38-47 years (22.5%), 58-67 years (12%), and 18-27 years (11.5%). A small proportion (5%) were older than 67 years. The age range of

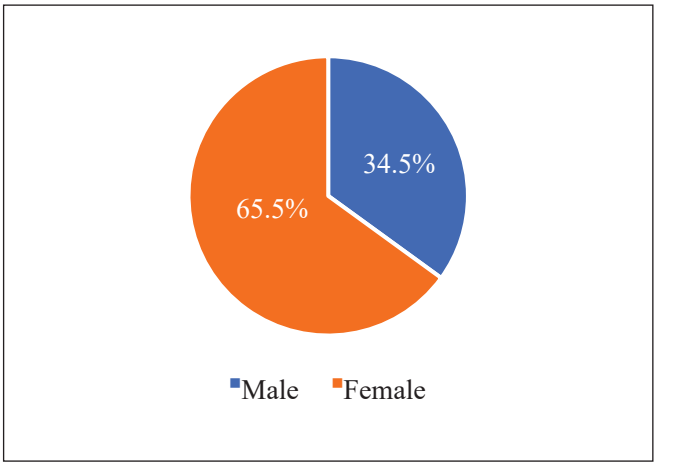

Figure-1: *Distribution of the patients according to their gender.*

Table-I: *Distribution of patients according to age, (n=200).*

Age group (years)	Frequency	Percentage
18-27	23	11.5
28-37	47	23.5
38-47	45	22.5
48-57	51	25.5
58-67	24	12
>67	10	5
Mean age±SD (years)	45.10 ± 14.30	
Age range (years)	17-76	

Table-II: *Distribution of respondents according to their BMI.*

BMI	Frequency	Percentage
<18.4	92	46
18.5-24.9	100	50
>25	8	4
Mean ± SD	25.67 ± 4.68	

Table-III: *Distribution of the respondents by their ABO blood grouping.*

Blood group	Frequency	Percentage
A	48	24
B	64	32
O	79	39.5
AB	9	4.5

Table-IV: *Distribution of the respondents by their family history of cholelithiasis.*

Family history	Frequency	Percentage
Present	102	51
Absent	66	33
Do not know	32	16

participants was 17 to 76 years, with a mean age of 45.10±14.30 years (table-I). In terms of BMI, half (50%) of the respondents had a BMI between 18.5 and 24.9, while 46% had a BMI below 18.4, and only 4% had a BMI above 25. The mean BMI was 25.67±4.68 (table-II). Blood group distribution among the patients revealed that 39.9% (79) of patients' blood groups were 'O', 32% (64) of patients' blood groups were 'B', 24% (48) patients were 'A' and only 4.5% (9) of patients' blood groups were 'AB'. Regarding family history of cholelithiasis, 51% (102) of the participants reported a positive family history of gallbladder disease, while 33% (66) had no such history, and 16% (32) were unaware of any familial occurrence of the condition.

DISCUSSION

The formation of gallstones is influenced by various factors arising from a complex interplay among numerous genetic, environmental, and lifestyle factors. Significant contributors to the development of cholesterol gallstones include advancing age, female gender, specific ethnicities, obesity, hyperinsulinemia, dyslipidaemia, and adherence to a Western-style diet[16,17].

Gallstone incidence rises with age, particularly after 40, leading to a 4 to 10 fold increase in risk among older adults[7]. Examination of age-based distribution in the current research further indicates that the most prevalent age affected by cholelithiasis is the middle-aged group (48-57 years). The heightened occurrence of cholelithiasis in the middle-aged category may be attributed to an escalation in gallstone formation rates with progressing age. On reaching 20 years of age, the frequency of gallstone development amplifies with each successive decade[17-19].

The feminine gender is commonly acknowledged as a significant risk factor for gallbladder disease[3,20]. The current study's gender-based distribution of cholelithiasis shows a male-to-female ratio of 1:1.9. Similarly, previous research by Saxena et al. reported a ratio of 1:1.7, which is in line with the present findings[21]. This result also corresponds with other studies[22,23]. The mean body mass index (BMI) recorded was 25.81±9.95 kg/m², with nearly half of the patients falling within the 18.5-24.9 BMI range. This result is in agreement with a study conducted by Völzke et al[24]. The research reveals that individuals with blood group 'O' constitute the largest proportion, with 79 individuals (39%), a result that is consistent with another study titled 'Relation between ABO blood groups and cholelithiasis among the population in Al-Madina, Saudi Arabia, 2018: case-control study[25].

Numerous studies demonstrate the importance of family and genetic backgrounds in the development of gallstones. The specific reason behind the hereditary inclination towards gallstone disease remains unclear. Possible factors include genetic vulnerability or metabolic issues. More than 50% of patients in this research have a family history of cholelithiasis and other gallbladder diseases, aligning with findings from a study by Umesh Kumar Yadav[26].

LIMITATIONS

The limitation of the present study is its small scale as an epidemiological investigation. First, the cross-sectional design restricts the ability to determine causal relationships between age, gender, BMI, and cholelithiasis. The sample size of 200 patients from a single private hospital in Sylhet may not be reflective of the general population, and the purposive sampling method could introduce selection bias. Additionally, the study did not account for other factors such as lifestyle choices, comorbidities, or medication history, which could potentially affect the risk of cholelithiasis.

CONCLUSION

This study indicates a notable gender disparity, with women being more affected than men and a higher prevalence of gallstone disease among middle-aged individuals. The data also reveal that the majority of patients fall within a normal or underweight BMI category, suggesting that factors beyond body mass may contribute to gallstone formation. Additionally, the strong familial link observed emphasises the role of genetic predisposition in the development of cholelithiasis. This study recruited a small sample size. A larger sample size and a longer follow-up would provide more accurate results.

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