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An Analysis of Risk Factors and Clinical Outcomes of Choledocholithiasis in Patients at a Tertiary Care Hospital in Bangladesh.

Dr. Mohammad Syedul Islam[1], Dr. Md. Ariful Islam[2], Dr. Ruhus Safa Noor[3], Dr. Fahmida Faizha Shama[4], Dr Nayeema[5]

1. Associate Professor, Department of Internal Medicine, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh
2. Associate professor(cc) & Head, Department of ENT & HNS, Dhaka Community medical college, Dhaka, Bangladesh.
3. Assistant Registrar, Department of Dermatology & venereology, Mugda Medical College Hospital, Dhaka, Bangladesh.
4. BDS, MPH, MPhil (on course), National Institute of Preventive and Social Medicine, Dhaka, Bangladesh.
5. Consultant, Department of Sonologist, Addin Hospital, Dhaka, Bangladesh

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Background: Choledocholithiasis represents a prevalent biliary disorder characterized by the presence of calculi within the common bile duct, resulting in notable clinical complications and morbidity. This study endeavors to examine the clinical profile and sign-symptoms of patients diagnosed with choledocholithiasis at a tertiary care hospital in Bangladesh, with a particular focus on demographic patterns and related comorbid conditions.
Methods: This observational study was conducted at a Private Hospital Dhaka between January-2024 and December 2024, involving seventy patients diagnosed with choledocholithiasis. Data were gathered through a comprehensive review of clinical records, encompassing demographic information, clinical features, lifestyle factors, comorbidities, and symptoms.
Results: The study revealed that choledocholithiasis was most prevalent among middle-aged males (71.43%) aged between 41 to 60 years, constituting 57.14% of the total population with sedentary lifestyles, high-fat diets (57.14%), and comorbidities such as diabetes and obesity. Common symptoms included abdominal pain (80%), jaundice (71.43%), and fever (51.43%), while predominant clinical signs were right hypochondriac tenderness (91.43%) and icterus (88.57%). These findings underscore the importance of demographic, lifestyle, and clinical features in the diagnosis and management of

choledocholithiasis.
Conclusion: This study offers an overview of the clinical characteristics and demographic profile of patients of choledocholithiasis in Bangladesh. The findings indicate a need for interventions targeting lifestyle factors, managing comorbidities, and considering gender-based risk stratification. Further studies are necessary to evaluate the long-term impact on disease progression and patient outcomes.

Corresponding author
Islam MS*

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INTRODUCTION

Gallstone disease is one of the most prevalent medical conditions globally, contributing significantly to abdominal morbidity and mortality. Cholecystectomy, a common surgical procedure, is frequently performed to treat this condition, which results from the impaired metabolism of cholesterol, bilirubin, and bile acids, leading to the formation of gallstones in the gallbladder, hepatic bile duct, or common bile duct (CBDS) [1,2]. It is estimated that 10–20% of individuals with gallstones will develop choledocholithiasis, either concurrently or subsequently [3]. The condition predominantly affects adults and shows increased prevalence with advancing age, particularly in middle-aged and elderly populations [4,5].

Several demographic and lifestyle factors have been implicated in the pathogenesis of choledocholithiasis. A high-fat diet, obesity, sedentary behavior, and metabolic comorbidities such as diabetes mellitus and hypertension are known to contribute to gallstone formation and biliary complications [6,7]. Globally, gallstone disease demonstrates a marked female predominance; however, studies suggest that choledocholithiasis may present more frequently and more severely in males in some populations [8,9]. Clinically, patients may present with a spectrum of signs and symptoms, including right upper quadrant abdominal pain, jaundice, fever, clay-colored stool, pruritus, nausea, and vomiting, depending on the severity and duration of biliary obstruction or infection [10,11].

Imaging modalities such as ultrasonography, magnetic resonance cholangiopancreatography (MRCP), and endoscopic retrograde cholangiopancreatography (ERCP) play a key role in diagnosis, but clinical history and physical findings remain essential for early suspicion and management, especially in low-resource settings [12,13]. Despite the clinical burden, there is limited published data from Bangladesh that systematically explores the demographic and clinical profiles of patients with choledocholithiasis. Understanding the common clinical patterns, comorbidities, and risk factors in the Bangladeshi population can help inform more efficient diagnosis, targeted prevention, and better outcomes. This study aims to evaluate the demographic characteristics, lifestyle patterns, comorbid conditions, and clinical features of choledocholithiasis patients admitted to a tertiary care hospital in Bangladesh, thereby contributing to local and regional data on this important public health issue.

METHODOLOGY

This observational study was conducted at a Private Hospital Dhaka from January 2024 to December 2024, with the objective of assessing the clinical features and demographic profile of patients diagnosed with choledocholithiasis. A total of 35 adult patients aged 21 years and above, confirmed to have choledocholithiasis through clinical assessment and imaging modalities such as ultrasonography, MRCP, or ERCP, were included using convenient sampling. Patients with incomplete records, previous biliary

surgery, or biliary tract malignancy were excluded. Data were collected using a structured checklist and review of medical records, capturing information on demographics, dietary habits, physical activity levels, comorbidities, body composition, presenting symptoms, and clinical signs. Descriptive statistics, including frequencies and percentages, were used for data analysis using SPSS version 23.

RESULTS

The study found that choledocholithiasis was most prevalent among middle-aged males with high-fat diets, sedentary lifestyles, and comorbid conditions such as diabetes and obesity. Table 1 outlines the demographic characteristics, dietary and physical activity patterns, comorbidities, and body composition of 35 patients diagnosed with choledocholithiasis in a tertiary care hospital in Bangladesh.

Table 1: Demographic Profile and Baseline Characteristics of Choledocholithiasis Patients (n = 35)

Variable	Category	Number of Patients	Percentage (%)
Age Group	21–40	6	17.14
	41–60	23	65.71
	≥ 61	6	22.86
Gender	Female	10	28.57
	Male	25	71.43
Diet Type	High Fatty Food	20	57.14
	Low Fatty Food	15	42.86
Physical Activity Level	Sedentary	20	57.14
	Moderate	11	31.43
	Heavy	4	11.43
Comorbidities	Diabetes Mellitus	13	38.57
	Hypertension	11	32.86
	History of Liver Disease	9	25.71
Body Composition	Normal Weight	7	20.00
	Overweight	17	48.57
	Underweight	2	5.71
	Obese	9	25.71

Demographic Profile and Baseline Characteristics

The majority of patients (65.71%) belonged to the 41–60 age group, suggesting that choledocholithiasis is most prevalent in middle-aged adults. Only 17.14% were aged 21–40, and 22.86% were aged ≥61, indicating a lower burden in younger and elderly populations. A notable male predominance was observed, with 71.43% of patients being male and 28.57% being female.

According to diet type, high fatty food consumption was reported by 57.14% of patients and low-fat diets were followed by 42.86%. A sedentary lifestyle was

predominant, with 57.14% of patients reporting low levels of physical activity. 31.43% engaged in moderate activity, while only 11.43% reported heavy physical exertion. Diabetes mellitus was the most prevalent comorbidity (38.57%), followed by hypertension (32.86%) and a history of liver disease (25.71%). Almost half the patients (48.57%) were overweight, and 25.71% were obese, reflecting a significant burden of unhealthy weight among the affected population. Only 20% had normal weight, and 5.71% were underweight.

Table 2: Distribution of Clinical Features Among Patients (n = 35)

Category	Symptom/Sign	Number of Patients	Percentage (%)
Symptoms	Pain	28	80.00
	Jaundice	25	71.43
	Fever	18	51.43
	Itching	11	31.43
	Dyspepsia, Nausea, Vomiting	5	14.29
	Clay-Colored Stool	12	34.29
Clinical Signs	Tenderness – Rt. Hypochondriac	32	91.43
	Icterus	31	88.57
	Elevated Temperature	19	54.29
	Scratch Mark	10	28.57
	Hepatomegaly	3	8.57

Table 2 highlights the most frequently observed symptoms and clinical signs among patients diagnosed with choledocholithiasis in a tertiary care hospital.

Symptoms

Pain was the most prevalent symptom, reported by 80% of patients, underscoring it as the primary presenting complaint in choledocholithiasis. Jaundice was also common, affecting 71.43%, which aligns with the obstructive nature of the disease. Fever was noted in 51.43%, suggesting associated infections such as cholangitis in a considerable number of cases. Clay-colored stool (34.29%) and itching (31.43%) are indicative of impaired bile flow and cholestasis. Dyspepsia, nausea, and vomiting were reported by only 14.29%, making them the least common symptoms.

Clinical Signs

Tenderness in the right hypochondriac region was the most frequent sign, found in 91.43% of patients, reflecting localized inflammation or biliary tract irritation. Icterus (jaundice visible on examination) was present in 88.57%, consistent with biochemical jaundice reported in symptoms. Elevated temperature was noted in over half of the patients (54.29%), reinforcing the clinical suspicion of infection. Scratch marks were observed in approximately 29% of patients, which is indicative of pruritus (itching). Hepatomegaly was identified in 8.57% of patients, indicating that liver enlargement is a relatively uncommon clinical finding in choledocholithiasis.

DISCUSSION

In this study, the majority of patients (65.71%) were categorized within the 41-60 age group. The youngest patient was 21 years of age, and the oldest was 75 years of age. Furthermore, our study documented a higher proportion of male patients, with 71.43% of the sample identifying as male, thereby resulting in a male-to-female ratio of approximately 2.5:1. This finding aligns with the research conducted

by Ravi MJ et al., wherein it was reported that 46.7% of patients were aged between 41 and 60 years [14]. In another study, Wani et al., observed a predominance of males in their cohort, albeit their study indicated the highest incidence within the 31-40 age group [15].

This study contributes to the literature by providing detailed insights into the age and sex distribution, risk factors, clinical signs, and symptoms of patients with choledocholithiasis. Our findings concerning gender distribution align with the studies conducted by Dharmesh P et al. and Chhoda A et al., both of which indicated a higher prevalence of choledocholithiasis in males in comparison to females [16, 17].

In this study, high-fat diet intake (57%) and sedentary lifestyle (57%) were also prominent. A North Indian case–control study found similar associations—frequent fried/oil-rich meals significantly increased risk (OR 2.5) [18]. In our study, 75% were overweight or obese, and 39% had diabetes. These findings mirror a Chinese population study showing obesity (BMI ≥25) doubled gallstone risk (OR 2.1) [19], and a 2008 cohort study from Japan linking diabetes to a 1.6-fold increase in gallstone formation [20]. These findings underscore the critical importance of managing lifestyle choices and comorbidities in the prevention and treatment of choledocholithiasis.

The symptoms frequently observed in our study encompassed abdominal pain (80%), jaundice (71.76%), fever (55.71%), as well as dyspepsia, nausea, and vomiting (36.47%). These findings are consistent with those reported by Wani NA et al., who indicated a prevalence of abdominal pain at 94.9%, fever accompanied by rigors at 13.44%, and jaundice at 43% within their cohort [15]. The considerable frequency of pain and jaundice observed in our study underscores the significance of these symptoms in the diagnosis of choledocholithiasis. Wani et al. and Joana Tozatti J et al., who emphasized that the symptoms of cholangitis, comprising right hypochondriac pain, jaundice, and fever- along with ultrasound evidence of stones present in the common bile duct- serve as critical preoperative indicators for choledocholithiasis [15,21].

In terms of clinical signs, tenderness in the right hypochondrium was the most common sign (91.42%), reflecting biliary colic and inflammation. This mirrors a 2007 clinical series in which 89% of choledocholithiasis patients had localized tenderness on examination [22]. Icterus (88.57%) was also highly prevalent in our patients, consistent with the presence of bilirubin accumulation due to ductal obstruction. These findings were similarly observed in studies from tertiary hospitals in India and China, which reported visible jaundice in over 85% of patients with choledocholithiasis [23,24]. Fever and elevated temperature were present in over half the patients (53.71%), often indicative of concurrent cholangitis or inflammatory responses to ductal stones. Previous studies reported fever in 40–60% of cases with complicated choledocholithiasis [25]. Scratch marks (28.57%) were a notable sign indicating pruritus, a frequent but underrecognized feature of cholestasis. A 2005 review highlighted the clinical importance of scratch marks in diagnosing chronic cholestatic disorders [26]. Hepatomegaly was rare (8.57%) in our sample, consistent with other studies suggesting that liver enlargement in isolated choledocholithiasis is uncommon unless associated with advanced liver pathology or prolonged obstruction [22,25].

CONCLUSION

This study provides a descriptive overview of the clinical features and demographic profile of patients diagnosed with choledocholithiasis at a tertiary care hospital in Bangladesh. The condition was observed predominantly among middle-aged males,

many of whom reported high-fat dietary habits, sedentary lifestyles, and comorbidities such as diabetes and obesity. The most frequent symptoms were abdominal pain, jaundice, and fever, while right hypochondriac tenderness and icterus emerged as the most common clinical signs on examination.

These findings reflect classical presentations of choledocholithiasis and highlight the importance of considering demographic and lifestyle patterns during clinical evaluation. While this study does not establish causal relationships, it underscores the relevance of routine clinical assessment in identifying and managing choledocholithiasis. Further research involving larger, multi-centered populations and diagnostic imaging data is recommended to build upon these findings and support broader public health planning.

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