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CLINICAL AND PARACLINICAL CHARACTERISTICS OF ACUTE CALCULOUS CHOLANGITIS AT NGUYEN TRI PHUONG HOSPITAL

Huynh Thanh Long[1,2*], Huynh Nhat Cao Nhan[1]

[1]*Department of General Surgery, Nguyen Tri Phuong Hospital - 468 Nguyen Trai, An Dong Ward, Ho Chi Minh City, Vietnam*
[2]*Department of General surgery, Faculty of Medicine, Nguyen Tat Thanh University - 300A Nguyen Tat Thanh, Xom Chieu Ward, Ho Chi Minh City, Vietnam*

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ABSTRACT

Objective: To describe the clinical and paraclinical characteristics of patients with acute calculous cholangitis at Nguyen Tri Phuong Hospital

Methods: A descriptive case-series study was conducted, retrospectively reviewing the medical records of 133 patients with acute calculous cholangitis admitted and treated at the General Surgery Department from January 2023 to February 2025. Data were analyzed using Stata, presented as frequencies, percentages, medians, and interquartile ranges.

Results: The median age of the study group was 66 (53–77) years; females accounted for 63.9%. Common comorbidities included hypertension (44.4%) and diabetes mellitus (29.3%). Abdominal pain (96.2%), fever (60.9%), and jaundice (36.8%) were the main symptoms. The median WBC was 13.8 G/L, CRP was 36.7 mg/L, and total bilirubin was 43.2 µmol/L. On ultrasound, intrahepatic bile duct stones were present in 75.9%. Among positive cultures, *E. coli* was the most common bacterium (40.3%).

Conclusion: Patients with acute calculous cholangitis were mainly elderly females with comorbidities, presenting with typical clinical and paraclinical features of infection and biliary obstruction.

Keywords: Acute cholangitis; Gallstones; Clinical characteristics; Paraclinical characteristics; *E. coli*.

1. INTRODUCTION

Acute cholangitis is a serious surgical emergency of the hepatobiliary system, characterized by biliary obstruction combined with bacterial infection. The primary pathogenic mechanism involves the stasis of bile flow due to stones, tumors, or biliary strictures, leading to increased intraductal pressure, retrograde bacterial invasion, and diffuse inflammation. Clinically, the disease typically manifests with Charcot's triad, consisting of right upper quadrant pain, fever, and jaundice; however, the symptomatic profile is increasingly diverse, especially in the elderly and in those with comorbidities [1].

In current clinical practice, the Tokyo Guidelines (TG13, TG18) are the most widely applied standard system for the diagnosis, severity grading, and management guidance of acute cholangitis [1]. According to these guidelines, gallstones remain the most common cause, accounting for 28% to 70% of cases, particularly in the Asian region. Furthermore, recent studies indicate that Gram-negative enteric bacteria, such as *Escherichia coli* and *Klebsiella spp*, continue to predominate in bile cultures, directly influencing antibiotic selection and patient prognosis.

In Vietnam, recent reports by Nguyen Cao Cuong et al. (Binh Dan Hospital, 2018) [2] and Ngo Thi Hoai (2025) [3] both report that acute calculous cholangitis accounts for a high proportion of hepatobiliary surgical emergencies, commonly occurring in elderly female patients with chronic comorbidities. However, descriptive data on the clinical and paraclinical characteristics at major municipal hospitals, especially at Nguyen Tri Phuong Hospital remain limited. A detailed description of the clinical and paraclinical features of patients with acute calculous cholangitis at the hospital is necessary to aid in early recognition, accurate severity classification, and

*Corresponding author
Email: htlong@ntt.edu.vn **Phone**: (+84) 913662056 **DOI:** 10.52163/yhc.v66i8.4071

selection of appropriate treatment strategies.

Study objective: To describe the clinical and paraclinical characteristics of patients with acute calculous cholangitis at Nguyen Tri Phuong Hospital.

2. SUBJECTS AND METHODS

2.1. Study design

A descriptive case-series study, combined with retrospective medical record review, was conducted at Nguyen Tri Phuong Hospital to investigate the clinical and paraclinical characteristics of patients with acute calculous cholangitis. A consecutive sampling method was applied to all eligible cases during the study period.

2.2. Study subjects

- Inclusion criteria:

+ Confirmed diagnosis of acute cholangitis according to the Tokyo Guidelines 2018 (TG18), including:

++ Signs of systemic inflammation (fever, elevated WBC, elevated CRP)

++ Evidence of cholestasis (jaundice, elevated bilirubin)

++ Imaging evidence of biliary obstruction (on ultrasound, CT scan, or MRCP)

+ Etiology confirmed as main bile duct stones (common bile duct stones, common hepatic duct stones, or stones associated with gallbladder stones)

+ Medical records with complete clinical and para-clinical information

- Exclusion criteria:

+ Acute cholangitis due to other causes such as pancreatic head tumors, benign strictures, trauma, or post-interventional complications.

2.3. Study variables

Variables collected included:

- General characteristics: age, gender, history of smoking, alcohol consumption, medical comorbidities (hypertension, diabetes mellitus), history of biliary surgery.

- Clinical symptoms: abdominal pain, pain location (epigastric, right upper quadrant...), fever, jaundice, nausea, diarrhea, abdominal wall rigidity, Murphy's sign, peritoneal signs.

- Laboratory tests: WBC, CRP, total/direct/indirect bilirubin, liver enzymes (SGOT, SGPT), urea, creatinine, blood glucose, amylase, albumin.

- Diagnostic imaging: ultrasound and CT scan (biliary dilatation, enlarged gallbladder, free fluid or air).

- Microbiology: bile culture results, bacterial identification

2.4. Study ethics

The study was approved by the Biomedical Research Ethics Council of Nguyen Tri Phuong Hospital. All patient information was kept strictly confidential and used only for scientific research purposes.

3. RESULTS

From January 2023 to February 2025, 133 patients with acute calculous cholangitis meeting the inclusion criteria were enrolled in the study. The median age was 66 (53 – 77) years, with females accounting for 63.9% (85 patients). Eight patients reported a smoking habit (6.0%) and 5 patients reported alcohol consumption (3.8%). Hypertension (44.4%) and diabetes mellitus (29.3%) were the two most recorded comorbidities in medical history. A history of biliary surgery was common, accounting for 30.1%.

The majority of patients presented with abdominal pain (96.2%), epigastric pain (66.9%); followed by fever (60.9%) and jaundice (36.8%). Key physical symptoms included abdominal wall rigidity (37.1%), a positive Murphy's sign (25.6%), and peritoneal signs (3.1%)

Table 1. Characteristics of functional and physical symptoms (n=133)

Variable	Frequency (n)	Percentage (%)
Functional symptoms		
Abdominal pain	128	96,2
Epigastric pain	85	66,9
Periumbilical pain	14	11,2
Right upper quadrant pain	42	33,1
Other pain location	5	3,9
Fever	81	60,9
Jaundice	48	36,8
Nausea	41	30,8
Diarrhea	5	3,8
Physical symptoms (n=132)		
Abdominal distension	1	0,8
Abdominal wall rigidity	49	37,1
Peritoneal reaction	3	2,3
Peritoneal signs	4	3,1
Murphy's sign	34	25,6

Laboratory findings showed median values as follows: WBC 13.8 G/L, blood glucose 9.2 mmol/L, urea 5.1 mmol/L, and creatinine 75.4 µmol/L. Ultrasound revealed intrahepatic bile duct stones in 75.9% and an enlarged gallbladder in 33.8%. Additionally, 33.8% had an enlarged gallbladder and 24.8% had fluid detected on CT scan. Among 133 abdominal fluid samples cultured, 72 cases (54.1%) were positive.

Table 2. Paraclinical characteristics (n=133)

Variable	Frequency (n)	Percentage (%)
Blood test results*		
WBC (n=133)	13,8 (8,7 – 18,1)	
CRP (n=117)	36,7 (6,6 – 110,8)	
Preoperative Bilirubin (n=125)	43,2 (20,9 – 68,6)	
Direct Bilirubin (n=130)	25,3 (13,7 – 43,2)	
Indirect Bilirubin (n=95)	17,2 (6,9 – 28,7)	
SGOT	81,9 (35,8 – 235)	
SGPT	82,4 (32,6 – 172,8)	
Glucose (n=118)	9,2 (5,9 – 87)	
Ure (n=124)	5,1 (3,7 – 6,1)	
Creatinin (n=130)	75,4 (65,1 – 101,4)	
Amylase (n=127)	79,3 (49,1 – 75,5)	
Albumin (n=24)	29,8 (28,2 – 36,6)	
Ultrasound results		
Fluid	18	13,5
Free air	8	6,0
Hepatomegaly	4	3,0
Enlarged gallbladde	45	33,8
Intrahepatic bile duct stones	101	75,9
Common bile duct dilatation (n=130)	14 (11-18)* mm	
CT-scan results		
Fluit	33	24,8
Free air	5	3,8
Hepatomegaly	4	3,0
Enlarged gallbladde	45	33,8

**: Median (Interquartile Range)*

Bacterial identification revealed *E. coli* as the most common pathogen (n=29, 40.3%), followed by *Klebsiella sp* (n=10, 13.9%), Streptococcus (n=8, 11.1%), Enterococcus sp (n=6, 8.3%), *Enterobacter agglomerans* (n=4, 5.6%), *Pseudomonas* (n=4, 5.6%), and *fungi* (n=4, 5.6%). Additionally, 14 cases (19.4%) belonged to other bacterial groups.

4. DISCUSSION

Acute calculous cholangitis is a serious surgical emergency among gastrointestinal diseases. The rate of complications increases and hospital stays are prolonged if patients do not receive early intervention and timely management, which can even lead to mortality [4]. Furthermore, clinical symptoms and patient characteristics also impact the treatment process and disease progression. The study recorded 133 patients with a median age of 66 years, which is younger than studies by Shuaijing Huang (76 years) [5] and Jean-Rémi Lavillegrand (72 years) [6] in the US, China, and France, but comparable to the study by Ramírez Riva Palacio L.A. in Mexico (61.8 years) [7] and Nguyen Thi Hue in Vietnam (64 years) [8]. This age difference may reflect the demographic characteristics of each region; accordingly, in developing countries like Vietnam and Mexico, the population structure is younger, the cause of cholangitis is primarily gallstones, and healthcare access in middle age is more favorable. Meanwhile, in developed countries like the US and France, acute cholangitis patients are often older, possibly related more to malignancies or complex underlying diseases.

In our study, the female sex was predominant at 63.9%, higher than some international studies such as Shuaijing Huang (47.8%) [5] and Jean-Rémi Lavillegrand (37%) [6], which reported a male predominance in acute cholangitis. However, in Vietnam, some studies, like that of Ngo Thi Hoai, also recorded a high female prevalence (63%), especially in elderly patient groups [3]. This difference may be related to the epidemiology of gallstones, which is a common cause of acute cholangitis.

Regarding comorbidities, hypertension (44.4%) and diabetes mellitus (29.3%) were the two most common conditions in our patient group, consistent with rates recorded in previous studies [5, 6, 8]. This may be due to the influence of the older age group in the study - a population prone to chronic diseases. The common presence of these comorbidities suggests their potential role in the pathological process of acute cholangitis, especially when combined with biliary obstruction factors due to stones. Additionally, the high rate of patients with a history of biliary surgery (30.8%) is similar to the findings of Harumi Gomi [9], indicating that previous surgical interventions may contribute to altering biliary anatomy and increasing infection risk.

In terms of clinical characteristics, abdominal pain was recorded in 96.2% of patients, consistent with the results of Nguyen Thi Hue (89%) [8] and Ngo Thi Hoai (70,4%) [3]. This confirms that abdominal pain remains the most prominent functional symptom in acute cholangitis, although the rate may vary depending on the patient group and time of diagnosis. Epigastric pain accounted for 66.9%, showing a fairly common tendency for localization to the epigastric region. Fever was recorded in 60.9% of patients, comparable to the results of Ngo Thi Hoai (60,2%) [3] and Harumi Gomi (70,5%) [9], %), but higher than the ICU study by Jean-Rémi Lavillegrand (31%) [6]; meanwhile, the rate of jaundice was 36.8%, lower than the studies by Ngo Thi Hoai (69,4%) [3] and Lavillegrand (63%) [6]. This difference suggests that patients in the study may have been detected and intervened upon early, while infectious symptoms were still clear and biliary obstruction had not progressed

severely.

Regarding paraclinical findings, the median WBC count in the study was 13.8 G/L, slightly higher than the mean values in Nguyen Thi Hue's study [8], where WBC in the early ERCP and delayed ERCP groups were 11.5 ± 6.5 G/L and 10.8 ± 5.4 G/L, respectively, it was lower than those reported by Jean-Rémi Lavillegrand (15,29 G/L) [6] and Ngo Thi Hoai (16,31 G/L) [3]. According to the Tokyo Guidelines 2018 [1], this level reflects a moderate inflammatory state upon admission. Urea (5.1 mmol/L) and creatinine (75.4 µmol/L) levels were within normal limits, while blood glucose (9.2 mmol/L) was elevated above the physiological level, suggesting secondary hyperglycemia due to acute infection or underlying conditions like diabetes mellitus, which was the second most common chronic disease in the study group. Overall, these indicators were not indicative of acute renal failure or severe metabolic disorders. Imaging findings revealed intrahepatic bile duct stones in 75.9% of patients and an enlarged gallbladder in 33.8% via ultrasound, similar to the high rate of biliary obstruction reported by Harumi Gomi, with over 60% of cases having common bile duct stones [9]. On CT scan, 33.8% of patients had an enlarged gallbladder and 24.8% had abdominal fluid, reflecting the degree of biliary obstruction and diffuse inflammation in the study patient group. These lesions may originate from the obstructive condition due to stones in the intrahepatic bile ducts, leading to cholestasis and creating conditions for bacterial growth. The local inflammatory reaction combined with increased pressure in the bile ducts can cause gallbladder distension and fluid leakage into the peritoneum, explaining the presence of abdominal fluid on the CT scan. These are common manifestations in the early stages of acute cholangitis if not promptly intervened upon. Microbiological culture results showed *E. coli* as the most prevalent pathogen (40.3%), followed by *Klebsiella sp* (13.9%), a finding consistent with the bacterial spectrum reported in previous studies [6, 9].

5. CONCLUSION

Patients with acute calculous cholangitis at Nguyen Tri Phuong Hospital are predominantly elderly females (median age 66), often with accompanying hypertension and diabetes mellitus. Abdominal pain (96.2%), fever (60.9%), and jaundice (36.8%) are common symptoms. Elevated WBC and CRP, with a median total bilirubin of 43.2 µmol/L, reflect the state of inflammation and biliary obstruction. Intrahepatic bile duct stones (75.9%) are the predominant imaging finding. In positive cultures, *E. coli* is the primary bacterium (40.3%).

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