

ORIGINAL ARTICLE

Acute Acalculous Cholecystitis in Dengue Fever: An Emerging Clinical Entity

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Abstract

Background: Dengue fever is a mosquito-borne viral disease that presents with a wide range of clinical manifestations, varying from mild febrile illness to severe systemic involvement. Although acute acalculous cholecystitis is classically observed in critically ill patients, it has recently emerged as a notable complication associated with dengue infection.

Objective: This study aimed to determine the incidence, clinical characteristics, treatment approaches, and outcomes of patients with acute acalculous cholecystitis secondary to dengue fever.

Methods: A retrospective study was carried out in the Critical Care Unit of Dhaka National Medical College Hospital over a 24-month period (August 2023 to July 2025). A total of 222 patients diagnosed with dengue fever confirmed by positive dengue NS1 antigen or IgM antibody tests were included after requiring surgical consultation. Clinical records, laboratory findings, and abdominal ultrasonography reports were reviewed. Acute acalculous cholecystitis was identified based on clinical presentation and sonographic findings. Data were analyzed descriptively and presented in tables and figures.

Results: Among the 222 confirmed dengue cases, 62 patients (27.9%) developed acute acalculous cholecystitis. The cohort included 36 males and 26 females. The mean time from fever onset to hospital presentation was 3.7 days (range 3–5 days). The average white blood cell count was 4216 ± 1374.7 /cm³ and the mean platelet count was $23,757 \pm 12,440.5$ /cm³. All patients presented with fever and headache (100%), while myalgia and arthralgia were observed in 90.5% and 89.2% respectively. Nausea and vomiting occurred in 87.8%, and abdominal pain was reported by 34.2%. Skin rash was noted in 11.7% of patients. Ultrasonography revealed gallbladder wall thickening in all 62 cases, pericholecystic fluid in 56 (25.2%), and a positive sonographic Murphy's sign in 51 (23.0%); no gallstones were detected. Mild to moderate ascites was present in 31 (14.0%) patients, hepatomegaly in 25 (11.3%), splenomegaly in 16 (7.2%), and mild pleural effusion in 24 (10.8%). The mean gallbladder wall thickness measured 6.1 ± 1.5 mm. All patients were successfully managed conservatively, without surgical intervention.

Conclusion: Acute acalculous cholecystitis represents an under-recognized but significant manifestation of dengue fever. Prompt ultrasonographic evaluation facilitates early detection, and conservative treatment strategies generally lead to favorable outcomes, thereby reducing unnecessary surgical procedures.

Keywords: dengue fever, acute acalculous cholecystitis, expanded dengue syndrome, gallbladder wall thickening, ultrasound, conservative management

Introduction

Dengue fever is an important vector-borne disease

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caused by the dengue virus, a single-stranded RNA virus belonging to the Flavivirus genus. Transmission occurs primarily through bites of infected female *Aedes aegypti* mosquitoes. The disease continues to pose a major public health concern across tropical and subtropical regions¹, particularly in South and Southeast Asia.²

In Bangladesh, dengue activity was first reported

during the 1960s, when it was occasionally referred to as “Dacca fever.”³ For several decades that followed, reported infections were sporadic, and large outbreaks were uncommon. However, a major change occurred in 2000, when the country experienced its first large-scale dengue epidemic, resulting in more than 5,500 hospital admissions and 93 documented deaths, including cases of dengue hemorrhagic fever.⁴ This event is often cited as a critical point marking the transition of dengue from a sporadic disease to a recurring national threat.⁵

Since that time, Bangladesh has faced almost annual dengue epidemics, characterized by increasing frequency, scale, and geographic distribution. The infection has now become endemic, with continuous background transmission and seasonal surges.⁶ All four serotypes of the dengue virus (DENV-1 to DENV-4) are known to circulate in Bangladesh, though their predominance varies by period. Prior to 2016, DENV-1 and DENV-2 were most frequently detected, whereas DENV-3 has been increasingly dominant in recent major outbreaks.⁷

Epidemiological data demonstrate a sharp rise in disease burden over recent years. In 2018, more than 10,000 confirmed cases and 28 deaths were reported nationwide, followed by a large outbreak in 2019 involving over 81,000 cases and 67 fatalities.^{8, 9} The situation worsened dramatically in 2023, when Bangladesh experienced its most severe dengue epidemic on record, with approximately 321,000 hospitalizations and 1,705 deaths by the end of the year.¹⁰ The infection spread to all 64 administrative districts, including previously less-affected rural areas.

Clinically, dengue infection can range from asymptomatic or mild febrile illness to classical dengue fever, dengue hemorrhagic fever, dengue shock syndrome, or expanded dengue syndrome.¹¹ Typical features of classic dengue include abrupt high-grade fever, severe headache, retro-orbital pain, generalized body ache, nausea, vomiting, and joint pain.¹² Atypical manifestations involving the liver, central nervous system, heart, or gastrointestinal tract have also been described, including acute pancreatitis, myocarditis, encephalopathy, and fulminant hepatitis.¹³

One notable Hepato-biliary complication is acute acalculous cholecystitis (AAC) an inflammation of the gallbladder occurring in the absence of gallstones.¹⁴ While AAC is classically associated with trauma, sepsis,

or critical illness, it has increasingly been reported in dengue patients presenting with acute abdominal pain.¹⁵ Such cases can resemble surgical emergencies such as acute appendicitis or perforated peptic ulcer, leading to diagnostic uncertainty.¹⁶ Ultrasound findings commonly reveal gallbladder wall thickening, pericholecystic fluid, and sometimes hepatomegaly, splenomegaly, ascites, or right-sided pleural effusion.¹⁶

Given these observations, the present study was undertaken to determine the frequency of acute acalculous cholecystitis among dengue patients and to evaluate its diagnostic and prognostic implications.

Materials & Methods

A hospital-based retrospective study was conducted in the Critical Care Unit of Dhaka National Medical College Hospital over two years (from 1 August 2023 to 31 July 2025) following the acquisition of informed consent from all participants. A total of 222 patients admitted with a confirmed diagnosis of dengue fever were included in this study. Each patient underwent detailed clinical evaluation, physical examination, relevant laboratory investigations, and abdominal ultrasonography. All patients required surgical assessment during their course of hospital stay. Clinical investigation reports and ultrasonographic findings were carefully reviewed. Dengue fever was confirmed by either a positive NS1 antigen test or a positive IgM antibody result. Acute acalculous cholecystitis (AAC) was diagnosed based on characteristic clinical features in conjunction with ultrasonographic evidence. The clinical manifestations included fever, right upper-quadrant tenderness, and a positive Murphy's sign. Ultrasound findings considered diagnostic for AAC included gallbladder wall thickening greater than 3.5 mm, presence of a sonographic Murphy's sign (maximum tenderness over the sonographically localized gallbladder), pericholecystic fluid collection, and absence of gallstones. Patients with recent burns, abdominal trauma, vasculitis, or surgery were excluded from the study. Routine laboratory parameters such as alanine aminotransferase (ALT) levels and complete blood counts were assessed and repeated when clinically indicated. Hepatomegaly was defined as a right-lobe craniocaudal length (mid-clavicular line) exceeding 16 cm, while a splenic index greater than 20 cm² indicated splenomegaly. All participants received standard supportive management, including intravenous fluids, antibiotics, antipyretics, and

anti-ulcerant. Continuous monitoring of vital signs was maintained until complete clinical recovery. The collected data were entered into a digital database and statistically analyzed using SPSS software (version 20.1).

Results

Table-I: Clinical presentation of Dengue fever patients (n=222)

Presentation	Number of patients	Percentage (%)
Fever	222	100
Headache	222	100
Myalgia	201	90.54
Arthralgia	198	89.18
Nausea and Vomiting	195	87.83
Abdominal pain	76	34.23
Rashes	26	11.71
Bleeding manifestations	0	0

All patients presented with fever and headache (100%). Most of the patients had myalgia 90.54% and arthralgia 89.18%. Patients presented with nausea, vomiting was 87.83%. And abdominal pain was complained by 34.23% patients.

Table-II: Abdominal ultrasonography findings of Dengue patients (n=222)

Findings	Number of patients	Percentage (%)
Thick-walled gall bladder	62	27.92
Pericholecystic fluid collection	56	25.22
Sonographic Murphy's sign	51	22.97
Stone in the gall bladder	0	0
Ascites	31	13.96
Hepatomegaly	25	11.26
Pleural effusion	24	10.81
Splenomegaly	16	7.20

Gall bladder found thick walled in 62 (27.92%) patients. Pericholecystic fluid collected in 56 (25.22%) patients and sonographic Murphy's sign present in 51 (22.97%) patients. None of these 62 patients have gall stone.



Figure-I: Ultrasonographic picture of increase wall thickness of gall bladder without stone in dengue patient

Discussion

The clinical presentation of dengue fever varies widely, ranging from simple febrile illness to severe hemorrhagic manifestations with or without shock. In the present study, all patients presented with fever and headache (100%), while myalgia (90.54%) and arthralgia (89.18%) were also common. Nausea and vomiting occurred in 87.83% of cases, and abdominal pain was reported by 34.23% of patients. Cutaneous rash was observed in 11.71% of the study population.

Acute acalculous cholecystitis (AAC) is increasingly recognized as a notable complication of dengue infection, particularly in endemic areas. The condition should be suspected when a dengue patient presents with right upper-quadrant pain, a positive Murphy's sign, mild transaminase elevation, and ultrasonographic evidence of gallbladder wall thickening. These findings are consistent with previous observations by Prasad et al. and Gulati et al.^{19,20}

Although the precise pathogenesis of AAC in dengue remains uncertain, Shapiro et al. suggested that cholestasis, increased bile viscosity, and infection may contribute to its development.²¹ However, the most widely accepted mechanism involves increased capillary permeability, leading to plasma leakage and serous effusion with a high protein concentration, primarily albumin.²² Gallbladder wall thickening, therefore, is considered a surrogate marker of plasma leakage and has been shown to correlate with disease severity.²³

In this study, out of 222 dengue patients, 27.92% were diagnosed with acute acalculous cholecystitis.

This incidence is higher than that reported by Wu et al., who observed AAC in 7.6% (10 out of 131) dengue cases,²⁴ and Khanna et al., who noted an incidence of 16.36% (9 out of 55 patients).²⁵ Among our AAC patients, 36 were male and 26 were female. The mean duration from onset of fever to hospital admission was 3.7 days (range 3–5 days). Mean white blood cell count was $4216 \pm 1374.7/\text{mm}^3$, and mean platelet count was $23,757 \pm 12,440.5/\text{mm}^3$ at presentation.

Laboratory profiles were consistent with typical dengue findings, including neutropenia, lymphocytosis, elevated hepatic transaminases, and thrombocytopenia.²⁶ Ultrasonography, as described by Wu et al.²⁷, often reveals gallbladder wall thickening, ascites, splenomegaly, and pleural effusion. In our series, all 62 patients with AAC demonstrated gallbladder wall thickening and pericholecystic fluid. Thirty-one patients had ascites, and twenty-four had minimal right-sided pleural effusion.

Management in all cases was conservative. Patients received intravenous fluids, antibiotics, antipyretics, and antiulcerant. As there was no bleeding manifestation, platelet transfusion was not required. None required surgical intervention, and all recovered without complications. These findings align with earlier institutional case series in which the mean gallbladder wall thickness was approximately 5.8 mm, and all patients improved with supportive management.¹⁴ Other reports confirm that, with appropriate dengue-specific care, operative treatment is rarely necessary.²⁸

Resolution of gallbladder wall thickening generally parallels the clinical recovery from dengue, and prognosis is excellent when the diagnosis is made early and treatment is supportive.²⁹ The primary diagnostic challenge lies in distinguishing dengue-associated AAC from other causes of acute abdomen. Misdiagnosis may lead to unnecessary surgical procedures, which carry additional risk in thrombocytopenic patients. Therefore, heightened clinical awareness, judicious ultrasonographic evaluation, and multidisciplinary management are crucial for optimal outcomes.

Conclusions

Acute acalculous cholecystitis is an under-recognized but clinically relevant complication of dengue fever. It should be suspected in patients with persistent right upper quadrant pain, thrombocytopenia, and ultrasound evidence of increased gall bladder wall thickness without gallstones. Conservative

management is usually sufficient, with surgery reserved for complications. Early recognition prevents unnecessary operative procedures and improves outcomes in dengue patients.

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