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ORIGINAL ARTILE

CLINICAL AND LABORATORY PROFILE OF DENGUE CASES IN A TERTIARY CARE HOSPITAL, DHAKA

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Abstract

Background: *Dengue fever is a painful, rapidly spreading vector-borne viral disease of global public health concern. The most recent dengue outbreaks in Bangladesh have demonstrated epidemiological patterns distinctly different from previous ones, with notable shifts in clinical presentation, serotype distribution, and disease severity. The aim of the study was to assess the clinical profile and laboratory findings of dengue patients presenting to a tertiary care hospital in Konia, Gazipur City, Dhaka.* ***Methods:*** *This cross-sectional study was conducted in the Department of Medicine, Tairunnessa Memorial Medical College & Hospital, Dhaka, Bangladesh, from February to December 2025. A total of 100 dengue patients were enrolled by purposive sampling. Diagnosis was established on the basis of clinical and laboratory parameters. Ethical approval was obtained and written informed consent was secured from all participants. Complete blood count, liver function tests, renal function tests, NS1 antigen, and dengue IgM/IgG serology were performed. Platelet count, haemoglobin, and haematocrit were monitored serially. Data were expressed as mean ± SD, frequency, and percentage. Chi-square and Z-proportion tests were performed using IBM SPSS Statistics, Version 26.0. A p-value <0.05 was considered statistically significant.* ***Results:*** *The majority of both female (16; 47.1%) and male (31; 47.0%) patients were in the 30–39-year age group. Mean age was 33.38±9.63 years for females and 33.62±9.21 years for males. Universal presenting symptoms included fever (100%), myalgia (100%), and nausea (100%), followed by headache (81%), retro-orbital pain (65%), diarrhoea (56%), abdominal pain (54%), vomiting (43%), rash (29%), and malaise (7%). NS1 antigen was positive in 76%, dengue IgM in 92%, and dengue IgG in 10% of patients. Mean AST was 74.76±59.73 U/L and mean ALT was 65.43±50.56 U/L, yielding a mean AST/ALT ratio of 1.19±0.49. An AST/ALT ratio >1 was observed in 65% of patients versus <1 in 35%; this difference was statistically significant (p<0.001).* ***Conclusion:*** *Dengue fever continues to represent a serious and evolving public health challenge in Bangladesh. The changing patterns of clinical presentation must be thoroughly understood, and continuous surveillance with timely intervention is essential to reduce morbidity and mortality.*

Keywords: *dengue fever; clinical profile; laboratory findings; NS1 antigen; AST/ALT ratio; Bangladesh*

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Introduction

Dengue fever is an acute viral, mosquito-borne disease caused by the dengue virus (DENV), comprising four serotypes—DENV-1 to DENV-4—belonging to the Flaviviridae family.[1] A putative fifth serotype (DENV-5) has additionally been reported in Malaysia.[2] Dengue is now endemic in over 100 countries and is recognized as the most rapidly spreading vector-borne viral disease globally.[3] The primary vectors responsible for transmission are Aedes aegypti and Aedes albopictus.[1]

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In tropical countries such as Bangladesh, dengue outbreaks typically occur during the monsoon and post-monsoon seasons. The clinical spectrum of dengue infection ranges widely, from a self-limiting febrile illness to dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS).[4] Common clinical manifestations include fever, headache, retro-orbital pain, myalgia, arthralgia, fatigue, rash, nausea, vomiting, and, in some cases, cough, nasal congestion, and pharyngeal erythema. Thrombocytopenia and leukopenia are characteristic laboratory findings in most patients.[4] The pathogenesis of severe dengue is complex, involving immune activation, cytokine storm, and vascular endothelial dysfunction, ultimately leading to plasma leakage and hemodynamic instability.[5]

The dengue outbreaks in Bangladesh in recent years have differed significantly from earlier epidemics, with shifts in disease epidemiology in terms of morbidity, mortality, and clinical presentation.[6] Previously predominant serotype patterns have changed, with DEN-3 emerging as the dominant serotype during recent outbreaks.[7] These serotypic shifts may partly explain the altered clinical presentations encountered in contemporary practice. Early clinical recognition and accurate severity stratification are vital to guide timely and appropriate management, thereby reducing preventable morbidity and mortality.

Given these evolving dynamics, this study was designed to assess the clinical profile and laboratory findings of dengue patients presenting to a tertiary care hospital in Konia, Gazipur City, Dhaka.

Methods:

This was a cross-sectional study conducted in the Department of Medicine, Tairunnessa Memorial Medical College & Hospital, Dhaka, Bangladesh, from February to December 2025. A total of 100 dengue patients were enrolled by purposive sampling. Patients were diagnosed on the basis of clinical features and confirmatory laboratory parameters, including NS1 antigen detection and dengue-specific serology (IgM and IgG). Patients with a confirmed diagnosis of other febrile illnesses—such as malaria, enteric fever, or urinary tract infection—were excluded.

Ethical approval was obtained from the institutional ethics review board prior to commencement of the study. The nature and purpose of the study were explained to each participant in detail, and written informed consent was obtained. Demographic data, clinical history, and physical examination findings were systematically recorded.

With aseptic precautions, 5 mL of venous blood was collected from the antecubital vein of each participant using a disposable syringe, for estimation of NS1 antigen, dengue IgM, and dengue IgG. Routine laboratory investigations included complete blood count, blood culture, liver function tests (LFT), renal function tests (RFT), urine routine examination and microscopy, and immunochromatographic testing (ICT) for malaria parasites. Chest X-ray and abdominal ultrasonography were performed when clinically indicated. Platelet count, hemoglobin, and hematocrit were monitored serially. Patients were also closely observed for fever trajectory, blood pressure, level of consciousness, hydration status, and bleeding tendency. Oral rehydration solution or intravenous fluids were administered according to hydration status. Packed red cell transfusion was provided in cases of severe anemia.

All data were recorded on a structured data collection form. Results were expressed as mean ± SD, frequency, and percentage, and presented in appropriate tables and figures. Chi-square and Z-proportion tests were performed as applicable using IBM SPSS Statistics for Windows, Version 26.0. A p-value <0.05 was considered statistically significant.

Results:

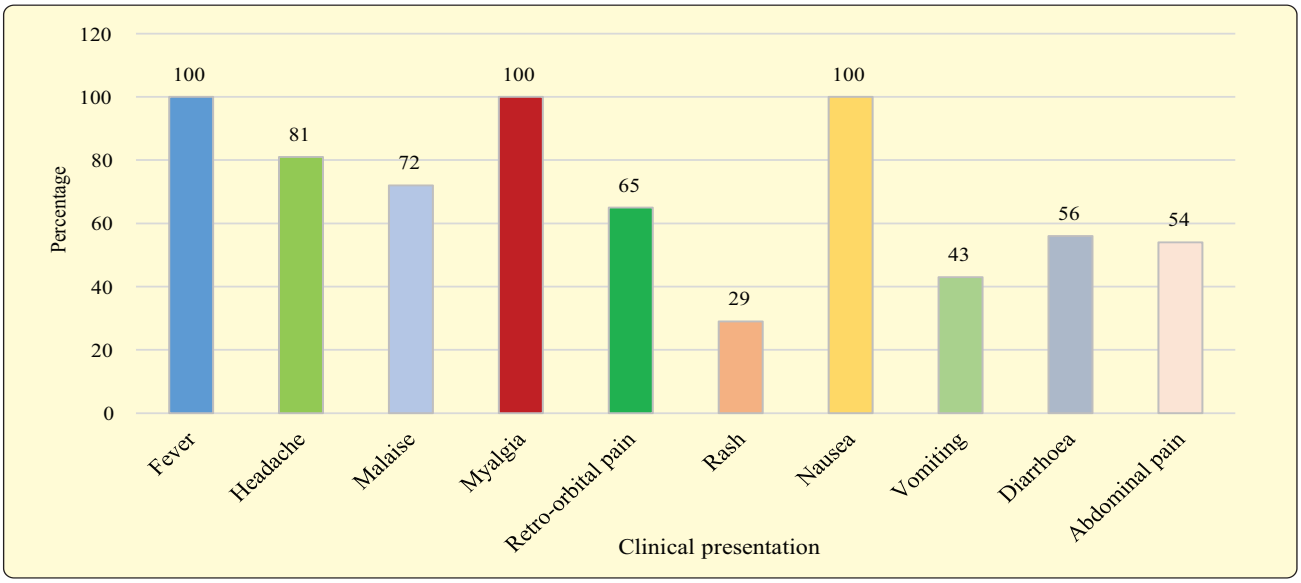
A total of 100 dengue patients were studied, comprising 66 males (66%) and 34 females (34%). The majority of both female (16; 47.1%) and male (31; 47.0%) patients belonged to the 30–39-year age group. The mean age of female patients was 33.38±9.63 years and that of male patients was 33.62±9.21 years, with no statistically significant difference between the sexes (p=0.888) (Table I).

Table I

Age and gender distribution of patients with dengue fever (n=100)

Age (Years)	Female	Male	Total	p value
20-29	12 (35.3%)	23 (34.8%)	35	
30-39	16 (47.1%)	31(47.0%)	47	
40-49	4(11.8%)	7(10.6%)	11	0.888
50-59	2(5.9%)	3(4,5%)	5	
>60	0(0.0%)	2(3.0%)	2	
Total	34	66	100	
Mean±SD	33.38±9.63	33.62±9.21		

Data were expressed in frequency, percentage and mean±SD, p value obtain from Chi Square test

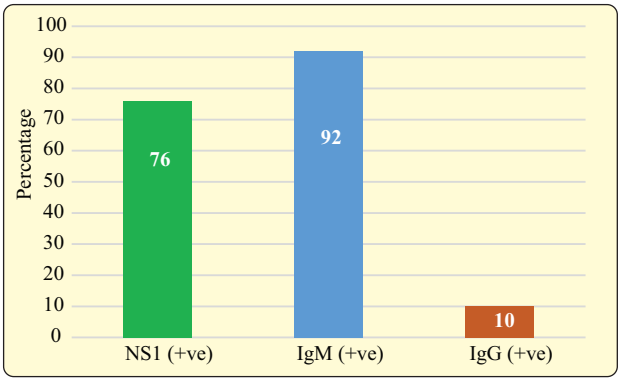


Data were expressed as percentage

Figure 1: *Distribution of study subject according to clinical presentation (n=100)*

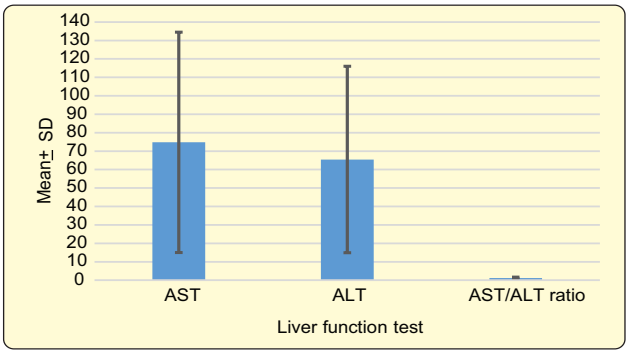
With regard to clinical presentation, fever (100%), myalgia (100%), and nausea (100%) were universal findings. Other common symptoms included headache (81%), retro-orbital pain (65%), diarrhoea (56%), abdominal pain (54%), vomiting (43%), rash (29%), and malaise (7%) (Figure 1).

Concerning serological findings, NS1 antigen was positive in 76% of patients, dengue IgM in 92%, and dengue IgG in 10% (Figure 2). Mean AST was 74.76±59.73 U/L, mean ALT was 65.43±50.56 U/L, and the mean AST/ALT ratio was 1.19±0.49 (Figure 3). An AST/ALT ratio >1 was found in 65% of patients and <1 in 35%; this difference was statistically significant (p<0.001) (Figure 4).



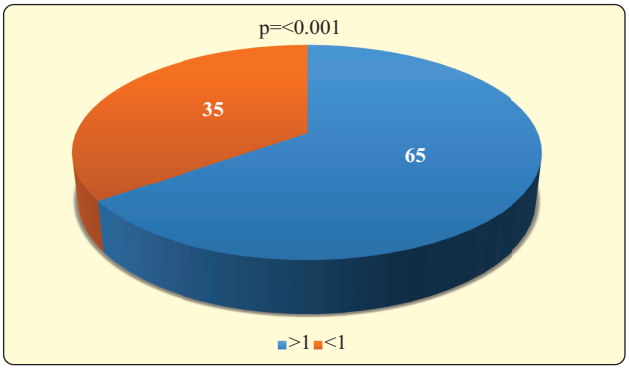
Data were expressed as percentage, multiple response present

Figure 2: *Distribution of study subject according to laboratory findings (n=100)*



Data were expressed as mean±SD

Figure 3: *Mean AST, ALT and AST/ALT ratio of the study subject (n=100)*



Data were expressed as percentage, p value was obtained from Z Proportion test

Figure 2: *Distribution of study subject according to AST/ALT ratio (n=100)*

Discussion:

The present study corroborates the well-established demographic and clinical profile of dengue fever in Bangladesh. The mean age of affected patients was approximately 33 years, reflecting the predominance of young adults-a pattern consistent with earlier reports from Bangladesh and the wider South Asian region.[8,9] Males constituted a greater proportion of cases (66%), which may reflect greater occupational outdoor exposure to the primary vector, Aedes aegypti.

All patients presented with fever, myalgia, and nausea, followed by headache (81%), retro-orbital pain (65%), diarrhoea (56%), abdominal discomfort (54%), vomiting (43%), and rash (29%). These findings are concordant with those reported by Nabi et al.[10] and Nandini et al.[11] The prominent gastrointestinal manifestations-including diarrhoea and abdominal pain-may occasionally pose diagnostic challenges and should be recognized as important features of dengue in the regional clinical context. Hossain et al.[2] and Khan et al.[7] identified fever as the hallmark symptom of dengue, while Sharma et al.[8] and Nabi et al.[10] similarly reported widespread systemic and gastrointestinal involvement, in keeping with our observations. These clinical profiles are further supported by the findings of Rahman et al.[12] and Alam et al.[13]

Regarding serological diagnosis, NS1 antigen was positive in 76% of patients, IgM antibody in 92%, and IgG antibody in 10%. NS1 antigen detection provides a reliable means of early dengue diagnosis before the antibody response develops, while IgM positivity indicates acute or recent infection. The lower IgG positivity suggests that most patients were experiencing primary dengue infection, as secondary infections are typically associated with higher IgG titres and a greater risk of severe disease.[14,15]

Hepatic involvement is a recognised feature of dengue infection, occurring in 60–90% of cases, and typically results from direct viral cytopathic effects, immune-mediated hepatocyte injury, and reduced hepatic perfusion.[16] Consistent with published literature, we observed disproportionate elevation of AST relative to ALT, with an AST/ALT ratio >1 in 65% of patients. This pattern is distinct from most other viral hepatitides, in which ALT usually exceeds AST. The preferential rise in AST likely reflects not only hepatocyte damage, but also viral involvement of extrahepatic tissues rich in AST, including cardiac and skeletal muscle, which may additionally be affected in dengue infection.[17,18]

Conclusion:

Dengue fever continues to represent a serious and evolving public health challenge in Bangladesh. Young adults constitute the most vulnerable demographic group, and the clinical presentation is characterized by a triad of fever, myalgia, and nausea, with significant gastrointestinal involvement. Hepatic dysfunction, manifesting as disproportionately elevated AST relative to ALT, is a consistent laboratory feature.

Limitations:

This study was conducted at a single tertiary care center with a relatively small sample of 100 patients, which may limit the generalizability of findings. Viral serotyping could not be performed due to time and resource constraints. A multicenter prospective study with a larger sample and serotyping capacity is recommended to further characterize the evolving pattern of dengue in Bangladesh.

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Conflicts of interest:

None declared.

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