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ORIGINAL ARTICLE

Clinical Profile and Outcome of Dengue for Current Scenario, Khulna, Bangladesh

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ABSTRACT

Background: *Dengue fever is an acute febrile illness spread by the bite of Aedes mosquitoes infected with one of the dengue viruses (DENV), a member of the Flaviviridae family, with four distinct but closely related serotypes (DENV-1 to 4). It is a major health burden particularly in tropical and subtropical areas of the world. Primarily transmitted by the female Aedes aegypti mosquito and to a lesser extent, Adeses albopictus. Symptoms range from fever, nausea, and rash to severe conditions like Dengue hemorrhagic fever (DHF) and Dengue Shock Syndrome (DSS), which involves hemorrhage and organ failure. In endemic countries such as Bangladesh dengue has transitioned from sporadic outbreaks to a sustained seasonal pattern with recent increased case numbers and fatalities. Understanding epidemiology, risk factors and disease burden is essential for prevention and control measures. Early diagnosis and monitoring are crucial to reduce morbidity and mortality.* ***Aim of the study:*** *This study aims to assess the common clinical profile and their outcome in patients admitted in Khulna medical college hospital of Bangladesh.* ***Methods:*** *This six-month cross-sectional study at Khulna Medical College hospital, Khulna aimed to evaluate the clinical profile and outcomes of 550 dengue-confirmed patients. Inclusion criteria included an oral temperature of 100.4°F or higher, fever for less than seven days, and specific symptoms like headache, joint pain, or vomiting. Exclusion criteria were other viral fevers or specific diseases. All patients were confirmed dengue cases based on NS1 antigen positivity. Data collection involved detailed clinical monitoring and examinations. Data were analyzed using SPSS (version 26.0).* ***Result:*** *The study included 550 dengue patients, mostly aged 20-40 years (50%), with a mean age of 27.15±14.089 years. Males comprised 60.45% of cases. Urban residents made up 70%. The mean monthly income was BDT 38,529. Fever was the most common symptom (93.18%), followed by nausea/vomiting (60.91%) and headache (45.91%). Common complications included breathlessness (41.36%), pleural effusion (39.09%), and abdominal ascites (29.55%). Hospital stays averaged 4.8±2 days, with 94.55% recovering and 5.45% dying. ICU stays averaged 2.2±2 days, with 58.64% staying three days or less.* ***Conclusion:*** *This study on dengue in Khulna, Bangladesh, found that most patients were adults (20-40 years) with a mean age of 27.15 years. Males were more affected, with fever as the primary symptom. Common complications included breathlessness and pleural effusion. The high recovery rate was 94.55%, with a 5.45% mortality rate.*

Keywords: *Dengue, Laboratory parameters and Viral infection.*

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INTRODUCTION

Dengue, a virus transmitted by mosquitoes, is the most prevalent arthropod-borne viral disease globally, representing a major global health threat. It is also referred to by other names, including break-bone fever or 7-day fever[1]. The primary vector responsible for spreading the dengue virus is the *Aedes aegypti* mosquito. The virus is transmitted to humans by the female *Aedes mosquito* through its bites, typically after the mosquito has fed on the blood of an infected individual. These mosquitoes breed in stagnant water, such as

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in water tanks, puddles, old tyres, and various containers[2]. *Aedes* mosquitoes, primarily including the female vectors *Aedes aegypti* and *A albopictus*, transmit the virus and are common in tropical and subtropical parts of the world[1]. The most vulnerable countries include Bangladesh, India, Pakistan, and Sri Lanka[3,4]. Prior to 2000, dengue outbreaks in Bangladesh were infrequent, with an epidemic resulting in 5,551 cases and 93 deaths. However, following the first recorded dengue outbreak in Bangladesh in 2000, the number of hospitalized patients has surged, surpassing 3,000 cases on six different occasions, with a peak of 10,148 cases in 2018[5]. Between January 01 and December 31, 2022, there were 62,382 dengue cases, including the highest number of 281 related deaths in Bangladesh's history of dengue fever reported by the Ministry of Health & Family Welfare (MOHFW)[6]. The signs and symptoms of dengue vary from non-specific febrile disease to classic dengue fever with haemorrhage and shock (Dengue Shock Syndrome)[7]. The initial symptoms of dengue typically include fever, nausea, vomiting, skin rash, and body aches. Classic dengue fever is characterized by a sudden onset of high fever (up to 40°C), intense headache, nausea, vomiting, severe joint and muscle pain, retro-orbital pain, and a centrifugal maculopapular rash. In contrast, severe dengue symptoms usually appear 1–2 days after the fever subsides and include abdominal tenderness and pain, vomiting at least three times a day, nosebleeds, blood in vomit (hematemesis), black stools (melena), fatigue, and restlessness[8]. Most cases of dengue are self-limiting; however, if not treated and handled in the early stage of this disease, it can become a life-threatening condition[7]. Severe dengue causes internal hemorrhage and organ failure[9]. Secondary dengue infections, advanced age, elevated hematocrit levels, low platelet counts, and prolonged activated partial thromboplastin time (APTT) have been identified as potential risk factors for developing severe dengue fever. These factors necessitate immediate hospitalization for affected patients[10-12]. Due to the wide range of clinical symptoms, diagnosing dengue accurately can be difficult. However, simple clinical and laboratory monitoring of affected patients helps lower morbidity and mortality rates. Severe dengue (SD) cases can be identified through clinical profiles, laboratory tests, and warning signs, allowing for early intervention and potentially saving lives. The outcomes of dengue patients admitted to critical care units have been less frequently studied, and the prognostic factors influencing the clinical outcome of critically ill dengue patients remain uncertain[13]. This study aims to assess the common clinical profile and their outcome in patients in the Khulna district of Bangladesh.

METHODS & MATERIALS

This cross-sectional observational study was conducted at the Department of Medicine, Khulna Medical College (KMC), Khulna, Bangladesh, over six months from June 2023 to July 2024. The primary aim was to evaluate the clinical profile and outcomes of dengue patients during the current outbreak in Bangladesh. A total of 550 dengue-confirmed patients were enrolled and analyzed.

Inclusion criteria:

- Patients with an oral temperature of 100.4°F or higher and fever for less than seven days.
- Patients report at least one specific symptom, such as headache, joint pain, backache, abdominal pain, vomiting, fatigue, anorexia, or diarrhea.

Exclusion criteria:

- Patients with other viral fevers.
- Patients with any other identified specific disease, febrile illness, or bleeding disorder.

All patients had confirmed dengue based on NS1 (non-structural protein) antigen positivity. The hospitals were conveniently selected for data collection and designated as dengue-specialized centres during the outbreak. Admitted patients were closely monitored, with important clinical and laboratory details recorded regularly on a standard case report form. Clinical examinations included vital signs, skin rashes, pleural effusion, breathlessness, ascites, hepatomegaly, and splenomegaly. Patients were selected based on laboratory confirmation of NS1 Ag or Anti-dengue IgM. Data were entered into Microsoft Excel and analyzed using SPSS (version 26.0). Descriptive statistics summarized demographic data and clinical profiles. Continuous variables, like age and laboratory values, were presented as mean±standard deviation (SD) or median (interquartile range). Categorical variables, such as gender and severity of dengue, were expressed as frequencies and percentages.

RESULTS

The study included a total of 550 patients with confirmed DENV infection. The majority of patients (56.36%) were between 20–40 years of age, followed by 26.36% in the 10–19 year age group, while 17.27% were above 40 years. The mean age of the cohort was 27.15±14.089 years. Males accounted for 60.55% of cases, compared to 39.45% females. Employment status was almost evenly distributed, with 50.36% employed and 49.64% unemployed. Most patients (70.00%) resided in urban areas, while 30.00% were from semi-urban or rural settings. Regarding monthly household income, 37.82% reported earnings between BDT 20,001–40,000, 33.09% earned ≤20,000, and 29.09% ≥40,000, with a mean monthly income of BDT 38,529±30,186 (Table 1). Clinical features revealed an average body temperature of 100.3±2.3°F. Fever was the most common presenting symptom, observed in 93.09% of patients. Other frequent symptoms included nausea/vomiting (60.91%), headache (45.82%), abdominal pain (29.45%), myalgia (26.73%), skin rash (24.91%), and itching (21.27%). Less common manifestations were diarrhea (19.45%), retro-orbital pain (4.91%), conjunctival suffusion (2.73%), and miscellaneous features in 6.73% of cases (Table 2). With respect to complications, breathlessness (41.27%), pleural effusion (38.91%), and ascites (29.45%) were the most prevalent. Bleeding manifestations were noted in 10.91% of cases, while multiple organ failure occurred in 9.09%. Other complications included hepatomegaly (7.64%), seizures (3.09%), and splenomegaly (1.27%) (Table 3). Table 4 summarizes patient

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outcomes. The mean duration of hospitalization was 4.8±2 days, with 62.73% of patients admitted for 3–6 days, 24.18% for ≤3 days, and 13.09% for more than six days. ICU stay averaged 2.2±2 days, with the majority (58.55%) staying ≤3 days. Overall, recovery was favorable, with 94.55% of patients discharged after improvement, while mortality was documented in 5.45% of cases.

Table – I: Socio-demographic characteristics of the patients with DENV infection (*n*=550)

Variables	Frequency (n)	Percentage (%)
Age (in years)		
10-19	145	26.36
20-40	310	56.36
>40	95	17.27
Mean ± SD	27.15 ± 14.089	
Gender		
Male	333	60.55
Female	217	39.45
Occupation		
Employed	277	50.36
Unemployed	273	49.64
Residence		
Semi-Urban/Rural	165	30.00
Urban	385	70.00
Monthly Income (BDT)		
≤20,000	182	33.09
20,001–40,000	208	37.82
≥40,000	160	29.09
Mean ± SD	38529 ± 30186	

Table – II: Clinical Features of patients with DENV infection (*n*=550)

Clinical Features	Frequency (n)	Percentage (%)
Temperature (Mean ± SD)	100.3 ◦F± 2.3 ◦F	
Fever	512	93.09
Abdominal Pain	162	29.45
Diarrhea	107	19.45
Skin Rash	137	24.91
Itching	117	21.27
Myalgia	147	26.73
Nausea/Vomiting	335	60.91
Headache	252	45.82
Conjunctival suffusion	15	2.73
Retro-Orbital Pain	27	4.91
Others	37	6.73

Table – III: Complications experienced by patients with DENV infection (*n*=550)

Complications	Frequency (n)	Percentage (%)
Bleeding	60	10.91
Pleural Effusion	214	38.91
Breathlessness	227	41.27
Ascites	162	29.45
Hepatomegaly	42	7.64
Splenomegaly	7	1.27
Seizures	17	3.09
Multiple Organ Failure	50	9.09

Table – IV: Outcome of Dengue infection in studied patient (*n*=550)

Variables	Frequency (n)	Percentage (%)
Duration of hospitalization (in days)		
≤3	133	24.18
03-6	345	62.73
>6	72	13.09
Mean±SD	4.8±2	
ICU stay (in days)		
≤3	322	58.55
03-6	205	37.27
≥6	23	4.18
Mean ±SD	2.2±2	
Recovery	520	94.55
Death	30	5.45

DISCUSSION

Over the last few years, dengue has emerged as a rapidly growing public health threat, contributing significantly to global morbidity and mortality. Its rising incidence has been closely linked to rapid and unplanned urbanization, poor sanitation, and environmental conditions that favor mosquito breeding. In Bangladesh, dengue transmission typically peaks during the monsoon (around 50%) and post-monsoon (49%) seasons, particularly from July to October, reflecting seasonal dynamics of vector activity[14]. Given its increasing burden, our study explored the socio-demographic characteristics, clinical features, complications, and outcomes of dengue patients in Khulna. In the present study, the majority of dengue cases (56.36%) occurred in adults aged 20–40 years, with a mean age of 27.15 years. This finding aligns with reports by El-Gilany in Saudi Arabia, where most cases were in the 16–44 years age group[15], and Rahman et al. in Bangladesh, who documented the highest incidence among 18–33 years[16]. Both highlight the higher susceptibility of young adults, likely due to greater outdoor exposure and occupational mobility. Conversely, younger children under 10 years were less affected (12.73%), a trend also observed in Nepal, Nigeria, and Cameroon[17–19]. A lower prevalence among children may be attributed to parental care, limited outdoor exposure, and, in our study, the fact that participants were largely recruited from private facilities, suggesting middle- to higher-income families residing in relatively clean environments. A male predominance was evident, with 60.55% of patients being male, consistent with previous studies from India and Bangladesh, which reported higher infection rates among men[20,21]. This may be related to increased outdoor activity, occupational exposure, and sociocultural factors influencing healthcare access. Regarding clinical presentation, fever was the most frequent symptom (93.09%), in agreement with studies conducted in Saudi Arabia, Pakistan, and India[15,22,23]. Nausea and vomiting (60.91%), headache (45.82%), abdominal pain (29.45%), myalgia (26.73%), and skin rash (24.91%) were also commonly reported. These findings are broadly comparable to those of Badreddine et al., who found abdominal pain and vomiting as predominant features[24], and El-Gilany, who reported headache (74.6%) and myalgia (67.6%) at higher

rates[15]. The frequency of skin rash in our study (24.91%) is consistent with reports from Saudi Arabia and India[15,23]. Ocular manifestations such as conjunctival suffusion (2.73%) and retro-orbital pain (4.91%) were relatively rare compared to other published data[15,25]. Complications in our study were dominated by respiratory manifestations, with breathlessness (41.27%) and pleural effusion (38.91%) being most common, followed by ascites (29.45%). These rates were notably higher than those reported by Godbole in India, where pleural effusion and ascites were observed in only 11% of cases[26]. Bleeding manifestations were detected in 10.91% of patients, slightly higher than some earlier reports, while multiple organ failure was observed in 9.09%. Hepatomegaly (7.64%), seizures (3.09%), and splenomegaly (1.27%) were less frequent but clinically significant. Other studies have highlighted a broad spectrum of severe complications, including acute respiratory distress syndrome (ARDS), encephalitis, myocarditis, disseminated intravascular coagulation (DIC), and acute kidney injury (AKI), underscoring the variable clinical course of dengue[27–29]. In terms of outcomes, the average hospital stay was 4.8±2 days, with most patients (62.73%) hospitalized for 3–6 days. ICU admissions were generally brief, with a mean stay of 2.2±2 days and the majority (58.55%) requiring three days or less. Overall, the prognosis was favorable, with a recovery rate of 94.55%, while mortality was recorded in 5.45% of cases. These figures are comparable to other studies from the region, which have similarly reported high recovery rates but highlighted the persistent risk of fatal outcomes in severe dengue[30]. Taken together, our findings reinforce that dengue predominantly affects young adults, manifests with typical febrile and gastrointestinal symptoms, and frequently leads to respiratory complications such as pleural effusion and breathlessness. While most patients recover with supportive care, the observed mortality emphasizes the need for early recognition of warning signs and timely management to reduce severe outcomes.

Limitations of the study:

The study's cross-sectional nature limits the ability to establish causality. The sample size of 550 patients, while adequate, may only partially represent the broader population affected by dengue in different regions of Bangladesh. Additionally, the study was conducted in a single medical college, potentially introducing selection bias as it may not capture cases treated in other healthcare settings. The reliance on self-reported symptoms could lead to reporting bias. Lastly, the study's six-month duration may not account for seasonal variations in dengue incidence, potentially affecting the generalizability of the findings.

CONCLUSION AND RECOMMENDATIONS

This study on the clinical profile and outcomes of dengue patients in Khulna, Bangladesh, found that the majority of cases involved adults aged 20-40 years, with a mean age of 27.15 years. Males were more affected than females. Most patients were urban residents, with fever being the predominant symptom, followed by nausea/vomiting and headache. Common complications included breathlessness and pleural effusion. The average hospitalization duration was 4.8 days, with a high recovery rate of 94.55% and a mortality rate of 5.45%. These findings highlight the critical need for early diagnosis and effective management to reduce dengue morbidity and mortality.

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