

Clinical presentation of Dengue fever in children in a tertiary care hospital

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Abstract

Background: Dengue fever is a very common tropical disease and also a major public concern in Bangladesh. It occurs in Bangladesh during and just after the rainy season. The risk factors of Dengue fever are environmental and climatic situation. Clinical manifestations of Dengue in children often vary. So, making early diagnosis of Dengue is very challenging.

Objective: To evaluate the clinical presentation of Dengue fever in children admitted to a tertiary care hospital in Bangladesh.

Methods: This cross-sectional study was conducted in the paediatric department of a Bangladesh Medical University over a six months period from July 2024 to December 2024. Fifty Children aged 6 months to 15 years were included.

Results: The majority of children belonged to the 5-10-year age group. Most patients (64.0%) were from urban areas, and males were predominantly affected (58.0%). The most common clinical features were fever (100.0%), abdominal pain (62.0%), vomiting (58.0%), rash (44.0%), diarrhoea (24.0%) and bleeding manifestations (44.0%). A positive tourniquet test was observed in 68.0% of cases. Pleural effusion and ascites were found in 16.0% and 28.0% of patients, respectively. Regarding disease severity, 18.0% had Dengue fever, 38.0% had Dengue hemorrhagic fever, 20.0% had Dengue with warning signs and 24.0% presented with Dengue shock syndrome.

Conclusion: Dengue fever in children presents with a wide spectrum of clinical features, ranging from mild febrile illness to severe life-threatening complications.

Keywords: Clinical presentation, Dengue fever, children.

Introduction

Dengue fever (DF) is the most critical illness among arthropod borne viral diseases which is transmitted by the *Aedes aegypti*. Bangladesh has experienced frequent Dengue outbreaks in recent years. Dengue has become endemic in more than 100 countries globally according to WHO. In a year, Dengue is believed to infect 50 to 100 million people worldwide, the mortality is 1 to 5 % without treatment and less than 1% with treatment, Dengue haemorrhagic fever carries a mortality of 26%.¹

In 2023, the world experienced the highest number of Dengue cases. The number of patients affected by Dengue has also risen in Asian countries.² According to Director General of Health Services (DGHS) of Bangladesh, 1705 people had to embrace death due to Dengue infection.³ Severe Dengue occurs more frequently in children.⁴ Infants and children aged 5-9 years bear the highest burden of Dengue infection.

The clinical manifestations of DENV infections can range from mild acute undifferentiated febrile illness to classical Dengue fever, Dengue hemorrhagic fever (DHF), Dengue shock syndrome (DSS).⁵ The symptoms include sudden appearance of high fever, retro-orbital pain, severe headache, joint and muscle pain, vomiting, nausea.⁶ Sometimes classical Dengue may develop DHF and plasma leakage is the hallmark of DHF and it may turn into DSS due to plasma leakage.⁷ There are three phases in DHF and they are the febrile, critical and convalescent phase. Early detection and appropriate fluid management are very much important.⁷ Unusual manifestations such as involvement of liver, kidney, brain or heart termed as expanded Dengue syndrome. There are some warning signs which is helpful for management of Dengue.

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The objective of this study was to observe the clinical presentation for better care of patients.

Materials and Methods

This cross-sectional study was conducted in the Department of General Paediatrics of Bangladesh Medical University over a six-month period from July 2024 to December 2024. A total of 50 children aged between 6 months and 15 years with clinically suspected Dengue fever and laboratory confirmation by positive Dengue NS1 antigen and/or Dengue IgM antibody were enrolled in the study. Children with known co-morbid conditions, including haemolytic anaemia, nephrotic syndrome, bronchial asthma, congenital anomalies, or prolonged fever lasting more than two weeks were excluded. Data were collected using a predesigned and pretested questionnaire. Detailed socio-demographic information, clinical symptoms, duration of illness, warning signs, bleeding manifestations and physical examination findings were documented. Clinical assessment included evaluation of vital signs, hydration status, urinary output, signs of shock, tourniquet test positivity, hepatomegaly, oedema, pleural effusion and ascites. Dengue classification and warning signs were assessed according to standard clinical criteria. Relevant laboratory investigations including Dengue NS1 antigen, Dengue IgM antibody, haematocrit, and platelet count were reviewed from hospital records. Ethical considerations were maintained throughout the study. Written informed consent was obtained from parents or legal guardians prior to enrolment. Permission for conducting the study was obtained from the concerned institutional authority. Data were analysed using the Statistical Package for Social Science (SPSS) version 26.0. Continuous variables were expressed as mean $\pm$ standard deviation (SD), whereas categorical variables were presented as frequency and percentage.

Results

A total of 50 children were enrolled in the study after fulfilling the inclusion and exclusion criteria. The majority of the patients belonged to the 5-10 years age group (66.0%), with a mean age of 7.52 ± 2.96 years, suggesting a higher susceptibility among school-aged children. Male predominance was observed, accounting for 58.0% of cases. Most children were from urban areas (64.0%). Regarding socioeconomic status, more than half of the patients belonged to the middle-income group (56.0%). A distinct seasonal variation was noted, with the highest number of cases occurring during the post-monsoon period (56.0%), followed by the monsoon season (40.0%), while only a few cases were reported during the pre-monsoon period (4.0%) (Table I).

Table I: Socio-demographic characteristics of children with Dengue fever (N=50)

Variable	No.	%
Age group		
<5 years	10	20.0
5–10 years	33	66.0
>10 years	7	14.0
Mean $\pm$ SD years	7.52 $\pm$ 2.96	
Sex		
Male	29	58.0
Female	21	42.0
Residence		
Urban	32	64.0
Rural	18	36.0
Socioeconomic status		
Low	12	24.0
Middle	28	56.0
High	10	20.0
Season of admission		
Pre-monsoon	2	4.0
Monsoon	20	40.0
Post-monsoon	28	56.0

Fever was present in all patients (100.0%). The most common symptoms were myalgia (76.0%) and poor oral intake (76.0%), followed by lethargy (70.0%), headache (64.0%), abdominal pain (62.0%) and vomiting (58.0%). Other notable clinical features included rash (44.0%) and bleeding manifestations (44.0%). Less common symptoms were retro-orbital pain (40.0%), diarrhoea (24.0%) and respiratory distress (24.0%), whereas arthralgia (8.0%) and convulsions (2.0%) were relatively uncommon (Table II).

Table II: Distribution of clinical features among children with Dengue fever (N=50)

Variable	No.	%
Fever	50	100.0
Headache	32	64.0
Retro-orbital pain	20	40.0
Myalgia	38	76.0
Arthralgia	4	8.0
Abdominal pain	31	62.0
Vomiting	29	58.0
Diarrhoea	12	24.0
Rash	22	44.0
Bleeding manifestation	22	44.0
Lethargy	37	70.0
Poor oral intake	38	76.0
Convulsion	1	2.0
Respiratory distress	12	24.0

The most common bleeding manifestation was petechiae (48.0%), followed by purpura (40.0%) and melaena (20.0%). Other manifestations included epistaxis (12.0%) and

haematemesis (10.0%), while menorrhagia (4.0%) and gum bleeding (2.0%) were relatively uncommon (Table III).

Table III: Distribution of bleeding manifestations in paediatric Dengue cases (N=50)

Bleeding manifestations	NO.	%
Petechiae	24	48.0
Purpura	20	40.0
Epistaxis	6	12.0
Gum bleeding	1	2.0
Haematemesis	5	10.0
Melaena	10	20.0
Menorrhagia	2	4.0

The majority of the patients were clinically ill at presentation (58.0%), while 26.0% were in critical condition and only 16.0% were stable. The most common physical findings were a positive tourniquet test (68.0%), dehydration (58.0%), and rash (48.0%). Other notable findings included ascites (28.0%), edema (24.0%), shock (20.0%) and pleural effusion (16.0%). Hepatomegaly (14.0%), pallor (4.0%) and lymphadenopathy (4.0%) were observed less frequently (Table IV).

Table IV: Physical examination findings at admission among children with Dengue fever (N=50)

Physical examination findings		No.	%
General condition on admission	Stable	8	16.0
	Sick	29	58.0
	Critical	13	26.0
Pallor		2	4.0
Oedema		12	24.0
Dehydration		29	58.0
Lymphadenopathy		2	4.0
Rash (sign)		24	48.0
Hepatomegaly		7	14.0
Ascites		14	28.0
Pleural effusion		8	16.0
Shock		10	20.0
Positive tourniquet test		34	68.0

The most common warning sign was rising haematocrit associated with a falling platelet count (84.0%), followed by lethargy/restlessness (62.0%) and severe abdominal pain (52.0%). Persistent vomiting was observed in 46.0% of patients. Other warning signs included mucosal bleeding (30.0%) and clinical fluid accumulation (28.0%), while hepatomegaly (16.0%) was less frequently observed (Table V).

Table V: Distribution of warning signs among children with Dengue fever (N=50)

Variable	No.	%
Persistent vomiting	23	46.0
Severe abdominal pain	26	52.0
Clinical fluid accumulation	14	28.0
Mucosal bleeding	15	30.0
Lethargy/restlessness	31	62.0
Hepatomegaly	8	16.0
Rising haematocrit with falling platelets	42	84.0

The majority of patients were diagnosed with Dengue Haemorrhagic Fever (DHF) (38.0%), followed by Dengue Shock Syndrome (DSS) (24.0%). Dengue with warning signs accounted for 20.0%, while uncomplicated Dengue Fever (DF) was observed in 18.0% of cases (Table VI).

Table VI: Distribution of Dengue classification among children according to severity (N=50)

Dengue classification	No.	%
Dengue Fever DF	9	18.0
Dengue With Warning Signs	10	20.0
DHF	19	38.0
DSS	12	24.0
Total	50	100.0

Discussion

Age-related differences were observed in the prevalence of Dengue infection and its clinical features. In the present study, the majority of children belonged to the 5-10 years age group (66.0%), with a mean age of 7.52 ± 2.96 years, indicating a higher involvement of school-aged children. A similar finding was reported in another study, where the mean age ($\pm$ SD) was 6.66 ± 3.72 years.⁸ Male predominance was observed in this study (male 58.0%, female 42.0%), which is consistent with findings reported by Sultana et al⁹, Agarwal et al¹⁰, Narayan et al¹¹, Shahidul et al¹² and Ahmed et al.¹³ The majority of children in the present study were from urban areas, which is also consistent with previous studies.^{9,14}

In the present study, fever was present in all cases (100.0%). The most common symptoms were myalgia (76.0%) and poor oral intake (76.0%), followed by lethargy (70.0%), headache (64.0%), abdominal pain (62.0%), and vomiting (58.0%). These findings are consistent with those reported in other studies.^{9,14} In the present study, 44.0% of children had rash, including petechiae (48.0%) and purpura (40.0%), which is also consistent with findings from previous studies.^{12,14,15} Bleeding manifestations such as haematemesis (10.0%),

melen (20.0%), gum bleeding (2.0%) and epistaxis (10.0%) were observed and similar results have been reported by Shahidul et al¹² and Rahman et al¹⁶. In addition, the tourniquet test was positive in 68.0% of patients, which is also in agreement with findings from other studies.¹²

In this study, ascites was present in 28% of patients and pleural effusion was present in 16% of patients. Setiawan et al¹⁷ and Mehedi et al¹⁸ also found the presence of ascites and pleural effusion in severe Dengue cases. In our study, 52% of children had severe abdominal pain and 46% had persistent vomiting. Other different studies also showed that Dengue patients reported abdominal pain and vomiting.^{9,12,14}

In this study, it was found that 18% of children had DF, 38% DHF and 24% had DSS, whereas Kamrunnahar et al⁹ showed 74.15% of patients had DF, 6.74% had DHF and 10.10% had DSS. Ratageri et al¹⁹ showed 18% DF, 60% DHF and 22% DSS. In DSS patients of the study, shock (20%) were important clinical features which were similar to the findings of the study done by Chako et al.²⁰

Ratageri et al¹⁹ reported that thrombocytopenia was prominent in severe Dengue cases. The HCT level was found to be raised in severe Dengue patients in a study done by Pongpan et al.²¹ In our study, we found rising HCT with falling platelet is 84% of cases of DSS.

Conclusion

Dengue fever in children presents with a wide spectrum of clinical features, ranging from mild febrile illness to severe, life-threatening complications.

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