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Clinical Presentation of Dengue Fever among Bangladeshi Children: A Study of 100 Cases

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Abstract

Background: Dengue fever is a common tropical disease in Bangladesh. It is prevalent in Bangladesh during and just after the rainy season. The symptoms and signs are similar to many other diseases. **Objective:** The objective of the study was to observe the pattern of dengue fever in this institution for better care of the patients and also comparing with follow-up studies. **Methodology:** This cross-sectional study was conducted in the Department of Pediatrics at Holy Family Red Crescent Medical College Hospital, Dhaka, Bangladesh from May 2019 to August 2019. A total number of 100 patients were enrolled for this study. They were selected form the inpatient admission. **Results:** Most commonly children from the 5 to 10 years' age group were affected with slight preponderance of girls. About 90.0% patients presented with fever with chills and rigor. About 38.18 % children had uncomplicated dengue fever. Most common bleeding manifestation was melena (12.0%). About 21 patients had associated rickettsia infections. About 11 patients developed shock after admission only 22 patients had respiratory distress and 15 patients had pleural effusion. Six patients had neurological symptoms. **Conclusions**: Classical DF is most common form of the disease. This is followed by other two manifestations. [*Bangladesh Journal of Infectious Diseases, June 2022;9(1):25-30*]

Keywords: Dengue fever; rickettsia; pneumonia; bleeding manifestation; lethargy

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Introduction

Dengue is believed to infect 50 to 100 million people worldwide in a year and the mortality is 1.0 to 5.0% without treatment and less than 1.0% with treatment; however, severe disease like dengue hemorrhagic fever (DSS) carry a mortality of 26.0% cases[1]. The incidence of dengue in increased 30 folds between 1960 and 2010[1]. Infants are at high risk for DHF/DSS[2]. In South East Asia, the age-specific incidence of infant DHF was 0.5 per 1000 persons over the age of 3 to 8 months, and it disappeared by age 9 months[2]. Dengue in infancy has also been reported from Sri Lanka and India[2].

Dengue in infancy constituted 20.0% of total Dengue virus infections in an outbreak in Chennai, India[2]. The major burden of Dengue virus disease lies in

infants and children 5 to 9 years of age. Countries with a shorter or nonendemic history of Dengue virus circulation also report cases, principally in the adolescent and adult population[2]. This difference may be due to variations in circulating Dengue virus serotype and strain or to changes in susceptibility to infection or enhanced disease due to immune status[2].

Clinically, the manifestations of DENV infection can range from mild-acute undifferentiated febrile illness to classical dengue fever (DF), dengue hemorrhagic fever (DHF), and dengue shock syndrome (DSS)[3]. In a study by Afroza et al[4] 100% patients presented with fever followed by flushed appearance (72.0%), rash (43.0%), vomiting (39%) and abdominal pain (36.0%).

The primary dengue symptoms are usually noticed as headache, retro-orbital pain, arthralgia, myalgia, and appearance of rashes[5]. Some dengue fever patients develop the more serious form of the disease DHF with symptoms that include a decline in fever and presentation of hemorrhagic manifestations, such as microscopic hematuria, bleeding gums, epistaxis, hematemesis, melena, and ecchymosis[6]. The objective of the study was to observe the pattern of dengue fever in this institution for better care of the patients and also comparing with follow-up studies.

Methodology

Study Settings and Population: This was an observational study don from June 2019 to August 2019 in the Department of Paediatrics at Holy Family Red Crescent Medical College Hospital, Dhaka, Bangladesh. The admitted children with dengue fever were included in the study. No randomization was done. The patients who were admitted with fever and were Dengue NS1 and/or IgM positive were accepted as Dengue patients. All children aged from 6 months to 15 years diagnosed as Dengue fever as per case definition were included. Children with any known co-morbidity; like nephrotic syndrome, haemolytic anaemia, bronchial asthma or any form of congenital anomaly were excluded from the study.

Study Procedure: The parents were informed about the study, then a preformed detailed questioner was filled up with the necessary data and then it was analyzed. Age, sex, associated symptoms. associated illnesses, unusual bleeding, respiratory symptoms, abdominal signs, neurological signs were recorded. Investigations included CBC and either Dengue NS1 or Dengue IgG and IgM.

Statistical Analysis: Statistical analysis was performed by Windows based software named as Statistical Package for Social Science (SPSS), versions 20.0 (IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.). Continuous data were expressed as mean, standard deviation, minimum and maximum. Categorical data were summarized in terms of frequency counts and percentages. Chi-square test was used for comparison of categorical variables and Student t test was applied for continuous variables. Every effort was made to obtain missing data. A two-sided P value of less than 0.05 was considered to indicate statistical significance.

Ethical Consideration: All procedures of the present study were carried out in accordance with the principles for human investigations (i.e., Helsinki Declaration) and also with the ethical guidelines of the Institutional research ethics. Formal ethics approval was granted by the Director of the hospital of the Holy Family Red Crescent Medical College Hospital. Participants in the study were informed about the procedure and purpose of the study and confidentiality of information provided. All legal guardians of participants consented willingly to be a part of the study during the data collection periods. All data were collected anonymously and were analyzed using the coding system.

Results

A total number of 100 children were recruited after fulfilling the inclusion and exclusion criteria. Majority of the patients were in the age group of 5 years to 10 years which was 43(43.0%) cases followed by 18 months to 5 years which was 29(29.0%) cases. The mean age with SD of the study population was 6.66±3.72 years (Table 1).

Table 1: Age Distribution among the Study Population (n=100)

Age Group	**Frequency**	**Percent**
Up to 18 Months	6	6.0
18 Month to 5 Years	29	29.0
5 Years to 10 Years	43	43.0
<10 Years	22	22.0
Total	**100**	**100.0**
Mean±SD (Years)	**6.66±3.72**	

In this study female children are slightly more affected then male children.52 cases were female and 48 cases were male. Male and Female ratio was 1:0.92 (Figure I).

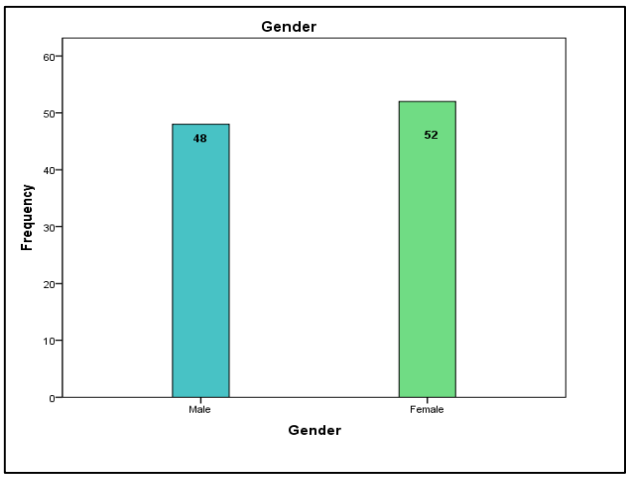

Figure I: Gender distribution of children (n=100)

Chills and rigor was the most common (90 patients) accompanying symptom of fever followed by 52 patients presenting with vomiting and 33 patients with whole abdominal pain (Table 2).

Table 2: Associated Symptoms with Fever

Symptoms	Frequency	Percent
Anorexia	9	9.0
Nausea	9	9.0
Vomiting	52	52.0
Fever with Chills/Rigors	90	90.0
Diarrhoea	25	25.0
Abdominal pain	33	33.0
Shock	14	14.0

*Multiple response analysis was performed

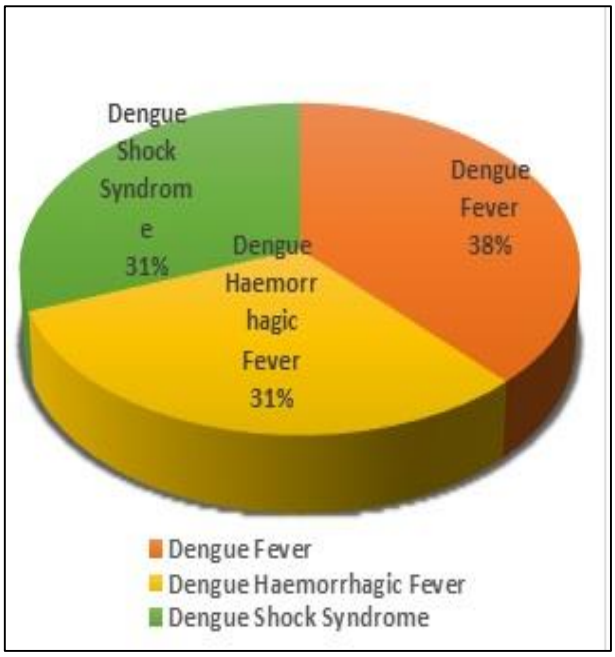

Figure II: Types of Dengue Fevers

The incidence of dengue fever was 38.0% cases followed by equal incidence of DSS and DHF 31.0% each (Figure II).

Table 3: Associated illnesses with Dengue

Associated illnesses	Frequency	Percent
Rickettsia	21	21.0
Pneumonia	12	12.0
Enteric fever	7	7.0
UTI	4	4.0
Septicemia	1	1.0

Most common was Rikettsial infection (21.0%) followed by pneumonia (12.0%) (Table 3).

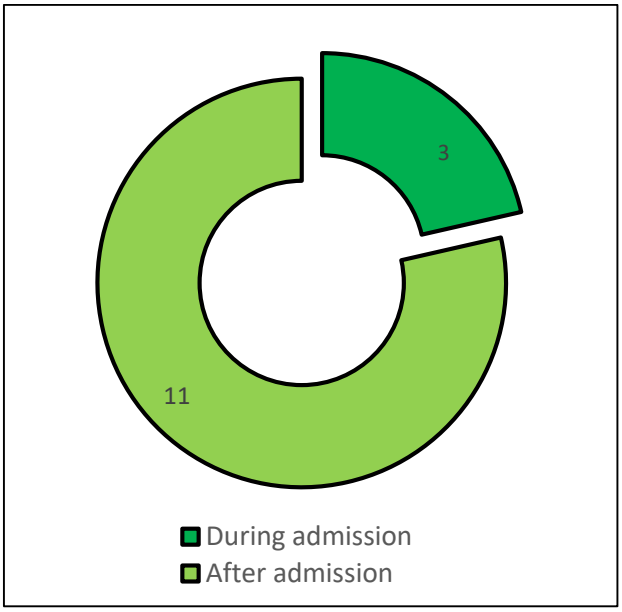

Figure III: Patients with Shock (n=14)

Most patients (11 patients) developed shock after admission in the hospital. Three patients had shock during admission (Figure III).

Table 4: Frequency of Unusual Bleeding and Sites (n=100)

Site of Bleeding	Frequency	Percent
Gum Bleeding	3	3.0
Nose Bleeding	1	1.0
Hematemesis	2	2.0
Melenac	12	12.0
Haematuria	0	0.0
Unusual Vaginal bleeding	1	1.0
Total	**19**	**19.0**

Of the 100 children only 19 patients presented with unusual bleeding. The most common presentation was melena (Table 4).

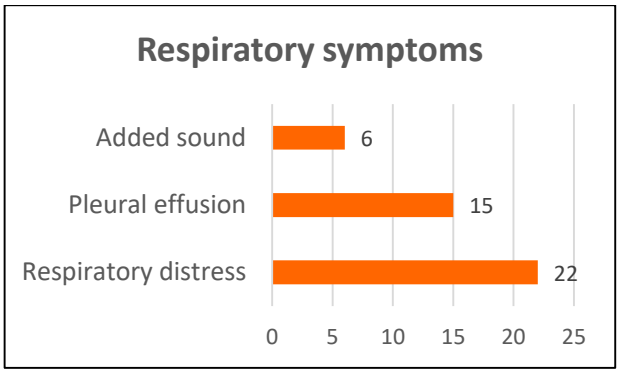

Figure IV: Respiratory symptoms (*n*= 100 patients)

About 22.0% patients presented with respiratory distress and 15.0% patients had pleural effusion (Figure IV).

Table 5: Distribution of Abdominal signs (*n*= 100 cases)

Signs	Frequency	Percent
Tenderness	14	14.0
Ascites	13	13.0
Hepatomegaly	3	3.0

Fourteen patients had right upper quadrant tenderness and thirteen patients had ascites. No patients had splenomegaly (Table 5).

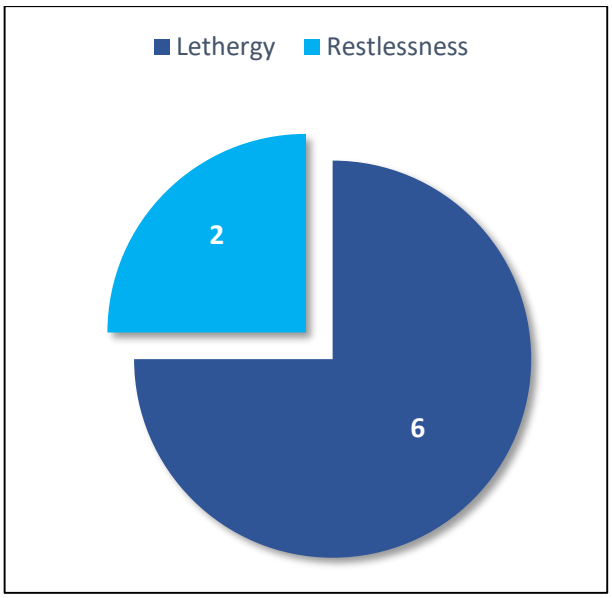

Figure V: Distribution of Neurological signs (n = 8)

Only eight patients had neurological signs. Of these six patients were lethargic and two patients were restless (Figure V).

Discussion

Age-related differences have been identified in the prevalence of dengue diseases and their specific clinical manifestations. In this study the 5 year to 10-year group of children were mostly affected (43.0%) followed by the 18 months to 5 years' group (29.0%). In other studies, this was similar, i.e. the mean age (standard deviation) of the presentation was 6.9±3.3 years and male: female ratio was 1.2:1[7]. Hospital based study in Delhi showed male to female ratio 2.5:1.12[8]. Mean age of presentation was 6.9 (±3.3) years and male and female ratio was 1.2:1[9]. There were 77(63.6%) men and 44(36.4%) women[10]. In this study there was a slight female predominance (52 patients).

This present study showed that classical dengue was in 42.0%, dengue haemorrhagic fever was in 43.0% and dengue shock syndrome 24.0% patients. In other studies, dengue fever (8.0%), dengue hemorrhagic fever (51.0%) and dengue shock syndrome (42.0%). The mean age (± SD) of children were 8.3±3.5 years with male: female ratio 1.32[11]. In Mittal et al's[11] study, 123 (25.4%) had a final diagnosis of clinical DF, 193 (39.9%) as DHF and 163 (33.7%) as DSS[11]. Karyanti et al[12] found classical dengue within 5 and 15 years with mean age of presentation at 8 years[12]. Severe dengue was more commonly seen in children between 10 and 15 years[13].

In present study, most common presentation was fever (100.0%), chills and rigor (90.0%), vomiting (52.0%), abdominal pain (33.0%) and bleeding manifestations (19.0%); in the form of petechiae, purpura, gum bleeding, melena and vaginal bleeding. In other study the most common clinical manifestations were fever (94.6%), conjunctival congestion (89.6%), myalgia (81.9%), coryza (79.7%), headache (75.1%), palmar erythema (62.8%), and retro-orbital pain (51.3%)[7].

In study done by Mittal et al[11] showed that fever (100%), headache (63%), abdominal pain (71%) and petechiae (35.5%) were more common[11]. Fever, vomiting were most frequent symptoms in addition, headache, and anorexia was also frequently found[8]. Abdominal pain reported in 84% in another study[14]. Fever was seen in all cases (100%). In dengue infection, common symptoms included weakness, nausea/vomiting, headache, body pain, and bleeding diathesis[10]. Fever was present universally in all

patients with mean duration of illness at presentation of 4.6 d. Complaints with which patients presented were vomiting (60.5%), pain abdomen (32%), headache (30.9%), myalgia (23.5%), bleeding manifestations (16%) and joint pain (2.5%)[13].

The clinical features included fever (100%), headache (63%), abdominal pain (71%), petechiae (35.5%), rash (26.6%) and bleeding manifestations (48.8%). Bleeding manifestations included epistaxis (44%), melena (16.6%), hematemesis (16.6%), hematuria (1.5%) and bleeding per vagina (1.5%) signs of fluid retention 23% (pedal edema-8, ascites-13, pleural effusion-6, facial puffiness-25, pallor (13.3%), signs of circulatory failure (43%), hepatomegaly (31.1%) and splenomegaly (27%)[11]. Epistaxis and gastrointestinal bleeding (melena) were the common bleeding manifestations noted along with petechiae, ecchymotic patches, gum bleeding, prolonged bleeding from IV injection site, hematuria and fresh GI bleed[13].

Other manifestations like pleural effusion, respiratory distress, ascites, hepatomegaly, neurological symptoms like lethargic and restlessness was present in few of our cases. Other complaints included respiratory distress, seizures and altered sensorium. CNS manifestations were noted in 8 patients out of whom 2 patients had seizures. Shock was the presenting feature in 18.5% of patients and icterus was noted in 2.5% of patients[13].

In this study right sided pleural effusion were more common. Although few patients resented with bilateral pleural effusion. Though pleural effusion was predominantly seen on right side, bilateral effusion was also commonly seen with only one patient presenting with isolated left sided pleural effusion[13]. Erythematous macular rash with facial flushing was present in 28.4%. Many patients were noted to have bradycardia and pruritus during recovery phase[13].

The common manifestations of severe dengue infection were shock (37.4%), bleeding (20.1%) and multiorgan dysfunction (2.4%). The most common atypical manifestations of dengue fever were lymphadenopathy (41.7%), splenomegaly (21.2%), biphasic fever (18.1%), hepatitis (11.4%), febrile diarrhea (6.3%), refractory shock (2.4%) and impaired consciousness (1.9%)[9]. Despite low platelet counts bleeding manifestations were relatively uncommon[15].

In their study by Inamdar et al[16], 71.28% (211 patients) patients had mucocutaneous manifestations[16]. Of these most patients had macular rash and petechiae. Mucosal manifestations in their study was vesicles on soft palate, erythema and crusting of lips and tongue, scleral congestion and nasal or palatal haemorrhage[16]. Chaudhary et al[17] reported 5 patients with dengue encephalitis confirmed by CSF study[17]. Although in present study none of the patients presented with dengue encephalitis.

Conclusions

Dengue is a common viral disease in Bangladesh. The virulence is changing every year. The knowledge obtained from this observational study can help us to be prepared for the signs and symptoms of the disease and help and treat the children. This will alleviate the sufferings of the patients and their families.

Abbreviations:
DHF-Dengue haemorrhagic fever
DSS-Dengue Shock syndrome
DV-Dengue virus
DF-Dengue fever

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Conflict of Interest
The authors have no conflicts of interest to disclose

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Contribution to authors:
Taher T and Fatmi LE conceived and designed the study, analyzed the data, interpreted the results, and wrote up the draft manuscript. Haroon K contributed to the analysis of the data, interpretation of the results and critically reviewing the manuscript. Taher T and Ashraf S involved in the manuscript review and editing. All authors read and approved the final manuscript.

Data Availability
Any inquiries regarding supporting data availability of this study should be directed to the corresponding author and are available from the corresponding author on reasonable request.

Ethics Approval and Consent to Participate
Ethical approval for the study was obtained from the Director of the hospital of the Holy Family Red Crescent Medical College Hospital. All methods were performed in accordance with the relevant guidelines and regulations.

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