Clinical Presentation of ICU Admitted Dengue Patients During an Outbreak in Bangladesh

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ABSTRACT

Background: Dengue fever is a mosquito born self limiting febrile illness. It may be asymptomatic or can result in a wide spectrum of disease severity ranging from an influenza like illness (Dengue fever) to the life threatening Dengue hemorrhagic fever (DHF)/Dengue shock syndrome (DSS). Dengue fever has currently become a serious public health problem. During 2019's Dengue outbreak more than 1 lac Dengue patients were treated in different hospitals of the country which was more than the double of the total number (50,181) in the last 19 years (2000 - 2018). During this outbreak not only the number of the patients increased, the clinical presentation of the patients has also changed.

Objectives: This study was designed to document the presenting features of Dengue infection in ICU admitted children during the Dengue outbreak in 2019 in Bangladesh.

Materials and Methods: This retrospective observational study was done among the children having Dengue infection and admitted in an ICU of a tertiary care hospital. All patients who were diagnosed as Dengue fever by serological tests (NS1, Dengue IgG and IgM) and admitted to ICU were included in this study. Total 126 (one hundred and twenty-six) patients were enrolled. Data were collected from hospital record files of every patient. Data was analyzed by SPSS version 20.

Conclusion: In this study we find out all the clinical features of Dengue patients who were admitted into the ICU. It was observed that Dengue fever had wide spectrum of clinical presentation in children ranging from flue like illness to life threatening hemorrhage and shock. Moreover, the presentation of dengue cases in this year were different from that of the previous ones. Unlike high fever, headache, eye pain or body ache (which were the typical features of Dengue in the previous years), many children had low grade fever associated with loose motion or vomiting and went into shock rapidly. Therefore, for early and proper diagnosis of the spectrum of Dengue fever we should be aware of the newer clinical presentations.

Keywords: High fever; Headache; Eye pain or body ache; Dengue fever.

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INTRODUCTION

Dengue fever is an acute febrile illness transmitted by the bite of Aedes mosquitoes. It can carry any one of the four dengue viral serotypes Dengue virus (DENV); (DENV-1 to DENV-4) belonging to the family Flavivirida. The virus serotypes are closely related but antigenically distinct.[1] There are currently no licensed vaccines or specific therapeutics, and substantial vector control efforts have not stopped its rapid emergence

and global spread. The contemporary worldwide distribution of the risk of dengue virus infection and its public health burden are poorly known.[2]

Almost half of the world's population is at risk of developing this illness, especially people residing in tropical and subtropical climates like Bangladesh. Every year around 390 million dengue infections are estimated to occur worldwide, of which a quarter of the cases (67–136 million) will manifest clinically,[2] with the overall incidence of dengue having increased 30 fold over the past 50 years.[1]

Bangladesh experienced first dengue cases in 1964, it was then named as "Dacca fever"and was coined. After those small commencement and sporadic cases were observed between 1964 and 1999.[3] The first official outbreak of dengue fever found in Bangladesh in the year 2000, and after that between 2002 to 2018 hospital admission of Dengue fever exceed more than 3000 for six times. 6232 in 2002, 3934 in 2004, 3162 in 2015, 6060 in 2016, 10148 in 2018. But in 2019 it exceeds more than 1 lac. Approximately 112000 cases were diagnosed and admitted in hospital by the end of 2019.[3-5] According to Director General Health Service (DGHS)– health emergency and control room source (November 30, 2019), more than 1 lac Dengue patients were treated in different hospitals of the country in 2019 which was more than double the total number (50,181) in last 19 years (2000-2018).[6]

The clinical manifestations of dengue infection range from mild febrile illness (i.e. DF) to severe hemorrhagic disease (DHF) and dengue shock syndrome (DSS).[7] Patients usually present with fever, arthralgia, myalgia, retro-orbital pain, rash, sub-conjunctival hemorrhages, respiratory symptoms, gastrointestinal (GI) disorders, reduced platelet count, raised hematocrit level, evidence of plasma leakage (pleural effusion, ascites) and abnormal liver function tests.[7] In severe cases patients may present with convulsion due to intra cranial hemorrhage.

Since our country is facing Dengue epidemic in almost every monsoon, we should have a clear knowledge about the clinical patterns of Dengue fever which will help in both the diagnosis and management of upcoming outbreaks.

In in this study, we aimed to investigate the clinico epidemiologic characteristics of the most recent DF outbreak in Bangladesh of ICU admitted patients in a tertiary care hospital.

METHODOLOGY

Present study was conducted in Paediatric Intensive care (PICU) unit of Dhaka Shishu Hospital (Since 22nd september 2021 it was named as Bangladesh shishu Hospital and Institute, which is the Largest tertiary care children's hospital in Bangladesh). This was a retrospective observational study. Data was collected from hospital record files. Duration of the study was 1st June 2019 to 31st December 2019. All patients who were diagnosed as Dengue fever by serological tests (either NS1 or Dengue IgG and IgM positive) and admitted to ICU were included in this study. History and examination findings of each patient were collected from hospital files of every patient. Data was analyzed by SPSS version 20.0.

RESULTS

Among 126 study patients 47.6% patients were male and 52.4% were female and male female ratio was 1.1:1. Children aged 0-5 years were 60 (47.6%), 6-10 years were 50 (39.7%) and more than 11 years were 16 (12.7%). Mean age was 5.91±3.53 (0-12). School going children comprised of 66 (52.4%) and

Table 1: Demographic profile of ICU admitted Dengue patients no-126

| Variable	Frequency (n)	Percentage (%)
Geographic Distribution		
Urban	108	85.7
Rural	18	14.3
Total	126	100
Gender of the patients (n=126)		
Male	60	47.6
Female	66	52.4
Age of the patients (n=126)		
0-5 years	60	47.6
6-10 years	50	39.7
11 years or above	16	12.7
Mean ±SD	5.91±3.53 (0-12)	
Schooling status (n=126)		
School going	66	52.4
Not School going	60	47.6

Not School going children comprised of 60 (47.6%). (Table 1)

Regarding the serological data of all study patients 80 (63.5%) patients were NS1 positive. Whereas 75 (59.5%) patients were IgG positive which indicate evidence of previous Dengue infection. And 69 (54.8%) were IgM positive which indicate recent Dengue infection. Both IgG and IgM positive patients were 30 (23.8%). Positive Result in multiple tests were found in the same patient. (Table 2)

Table 2: Distribution of Serologically Dengue positive patients

	Positive		Negative		Total	
	n	%	n	%	n	%
NS 1	80	63.5	46	36.5	126	100
IgG	75	59.5	51	40.5	126	100
IgM	69	54.8	57	45.2	126	100
Both IgG and IgM	30	23.8	96	76.2	126	100

A total of 85.7% study patients were admitted from urban area whereas only 14.3% patients came from rural area.
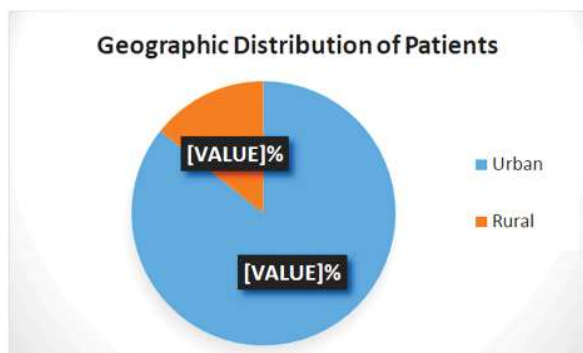
Fig. 1: Geographic Distribution of patients.

Table 3: Clinical Features: (n=126)

	Yes	
	n	%
Fever	126	100
Rash	36	28.6
Myelgia	10	7.9
Headache	20	15.9
Eye Congestion	3	2.4
Abdominal Pain	75	59.5
Abdominal Distention	29	23.0
Vomiting	74	58.7
Anuria	09	7.1
Shock	84	66.7
Convulsion	13	10.3
Bleeding	14	11.1
Tourniquet test+ve	03	2.4
Haematemesis	09	7.1
Malena	19	15.1
Respiratory distress	87	69.0
Pleural Effusion	55	43.7
Ascites	45	35.7
Hypotension	106	84.1
Narrow Pulse Pressure	91	72.2
ARF	03	2.4
Liver Dysfunction	07	5.6
DIC	13	10.3
Obesity	04	3.2

Multiple positive responses

Regarding the clinical features of all study patients, fever was present in all 126 (100%) patients. Rash present in 36 (28.6%) patients. Myalgia present in 10 (7.9%) patients. Eye congestion and tourniquet test positive was present in only 3 (2.4%) patients. Abdominal Pain was present in 75 (59.5%) patients, while abdominal Distention was present in 29 (23%) patients. Vomiting which is a warning sign was present in 74 (58.7%) patients. Anuria was present in only 9 (7.1%) patients. Shock was present in 84 (66.7%) patients. Few patients 13 (10.3%) presented with convulsion and 14 (11.1%) patients presented with bleeding. Hematemesis was present in 9 (7.1%) patients, and Malena was present in 19 (15.1%) patients and Ascites was present in 45 (35.7%) patients and plural effusion was present in 55(43.7%). Hypotension was present in 106 (84.1%) patients. Narrow pulse pressure was present in 91 (72.2%) patients. Only 3 (2.4%) patients were presented with ARF. Liver dysfunction was present in 7 (5.6%) patients. DIC was present in 13 (10.3%) patients. Out of 126 patients 4 (3.2%) patients were obese. (Table 3)

DISCUSSION

The present study revealed variable presentation of Dengue fever. Besides the previously known usual symptom of Dengue fever some new symptoms arise which was not found in the previous years. Previously fever, headache, myalgia, retro orbital pain, eye congestion, rash were the presenting complaints but this time we frequently came across patients with diarrhea, abdominal pain, low urine output which were considered as warning signs according to National Dengue guideline 2018.

This study showed a higher incidence of Dengue fever observed in younger age group (0-5 years) accounting for 47.6% and older children (11 years or above) suffered in lower number 16%. Similar result was observed in the study of Kamrun Naher et al.[8] where younger age group suffered more. Study done by ABM Shahidul Alam et al.[9] revealed same finding i.e younger age group suffered more than the older age group.

This study showed female patients were affected more than male patients. But M. J. Hasan et al. showed male preponderance in their study.[7] ABM Shahidul Alam, S Anwar Sadat, Zakaria Swapan et al. had found equal percentage of male and female patients in their study.[9]

Most of the patients in this study was serologically positive either by NS1 or by Dengue IgG and IgM. Some patients had positive results in more than one test. Almost all study patients had history of fever in this study. Other prominent clinical features are vomiting 58.7% and abdominal pain 55.9%, were observed in this study. Similar findings were found in several other studies.[10-13] In the Dengue outbreak of 2000 Aziz et al. and Hanif et al. found that skin rash was also a predominant feature.[14,15] But in the present study we found very few numbers 36 (28.6%) of patients had skin rash.

Arif et al. found active bleeding in the form of gum bleeding as the most common presentation with fever.[16] But it was present in a very small number, 11.1% patients in this study. However, a relatively high prevalence of Gastrointestinal (GI) symptoms was characteristically present in our study. It is also found in another study which has explored the clinical profile of dengue in a non-endemic zone of Bangladesh in 2019.[17] However, during the 2002 outbreak in Bangladesh, bleeding manifestations were present in up to 72% of the study population which decreased in subsequent years.[18,19] M. J. Hasan et al showed GI tract bleeding and diarrhea as a dominant feature in the 2019 outbreak and a decrease in the frequency of skin rash compared with that of previous outbreaks.[7,20]

Hypotension (84.1%), Narrow pulse pressure (72.2%) and shock (66.7%) was present in a good number of patients. This is an indicator of plasma leakage, an obvious feature of Dengue Fever. But these were not observed frequently in previous outbreaks where Den1 and Den2 were the predominant serotype.[21] This suggest a change in clinical presentation of severe dengue.

Pleural effusion and Ascites (both are evidence of plasma leakage) were found in 43.7% and 35.7% of study patients respectively in this study. Whereas ABM Shahidul Alam et al. found 27.8% case of Pleural effusion and 14.8% of case of Ascites which is less in comparison to present study.[9] M.J. Hasan et al. also found a smaller number of Pleural effusion 2.7% and Ascites 2.5% cases in their study.[7]

CNS involvement in form of convulsion was observed in 10.3% patients in this study. This is due to Dengue encephalopathy Jain H et al. found 4.3% patients with CNS involvement and Srinivasa K et al. found 2.24% patients with altered sensorium.[22,23]

CONCLUSION

Changing pattern of clinical features of Dengue Fever were observed in this study than that of the previous years. Unlike high fever, headache, eye pain or body ache (which were the typical features of Dengue in the previous years), many children had low grade fever associated with loose motion or vomiting and went into shock rapidly. Hypotension, narrow pulse pressure and shock was present in a good number of patients who were admitted in to PICU. Therefore, these changing patterns of presentation should be recognized for early diagnosis of the status of patient. Which might have a great impact in the future Dengue Fever outbreaks and also the morbidity and mortality of this endemic disease.

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