

Evaluation of Dengue Fever in A Tertiary Care Children Hospital of Bangladesh

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Abstract

Background : Dengue is a mosquito-borne (Aedes Aegypti) infection which in recent years has become a major public health problem. It is now endemic in more than 100 countries in Africa, America, Eastern Mediterranean, South-East Asia and Western Pacific areas. According to WHO currently approximately 50 million cases of dengue fever occur every year.

Objective : To evaluate the current clinical picture, outcome and serology of children suffering from dengue fever admitted in a tertiary care children hospital.

Methodology : It is a hospital based prospective observational study carried out among the children having Dengue infection admitted during the period of June to December 2016 in Dhaka Shishu (Children) Hospital. After obtaining informed consent 78 suspected cases of dengue fever patients were enrolled for this study. Patient with any identified specific infection or febrile illness more than 14 days and serologically dengue negative cases were excluded from the study. A detailed history, demographic variables, clinical examination and relevant laboratory investigations were assessed. The data were collected in a predesigned structured questionnaire and were analyzed with the help of SPSS-21.

Result : Out of 78 suspected dengue cases a total of 56 cases were serologically dengue positive. Therefore 22 serologically dengue negative cases were excluded. Most common presenting symptoms were fever (100%) followed by myalgia 76.79%, retro-orbital pain 73.21%, and conjunctival hemorrhage 55.35%, skin rash 55.35%, with other symptoms constituting the rest. Among the serologically positive dengue cases those who presented with fever for 3 days or of lesser duration, NS1 Ag was positive in 34 cases (43.58%) and those who presented with fever for 6 days or more, 14 cases (17.95%) were dengue IgM positive and 8 cases (10.25%) were dengue IgG positive with accompanying low level IgM positive; platelet count 94333/mm³ (± 68330), PCV 35 (± 3.95) and SGPT 210 U/L (± 80). Among 56 dengue positive cases 31 (55.4%) were male and 25 (44.6%) were female, The age range was 1 years to 18 years with mean 6.66 \pm 3.69, predominant age group was 6 years to 12 years. Final diagnosis according to WHO classification were DF 42.68%, DHF-I 32.14%, DHF-II 16.07%, DHF-III 8.93%. Outcome of the disease were 89.3% discharge with advice (DA), 7.1% discharge on request (DOR), 3.6% left against medical advice (LAMA) and no death.

Conclusion : The trend of Dengue infection in Bangladesh has been changing very rapidly. In this study our observation was incidence of dengue was more in male child, peak age group being 6 years to 12 years with most admissions during the month of September. Fever with pain (body ache, retro orbital pain), headache and maculopapular rash, positive NS1Ag and dengue IgM were the main findings found in children with dengue. Most of the dengue cases were DF and DHF-I in our study.

Key words : Dengue fever, dengue hemorrhagic fever, NS1 antigen, Dengue IgM, Dengue IgG

DOI: <http://dx.doi.org/10.3329/nimcj.v9i1.35928>

Northern International Medical College Journal Vol. 9 No. 1 July 2017, Page 274-277

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Introduction

Dengue fever is a self-limiting, systemic viral illness caused by several arthropod-borne viruses. Symptomatic dengue virus infections can present with a wide range of clinical manifestations, from mild febrile illness to a life-threatening shock syndrome. It is characterized by biphasic fever, myalgia or arthralgia, rash, leukopenia and lymphadenopathy. It may

increase capillary permeability. There is hemostatic abnormality, and in severe case, a protein-losing shock syndrome (dengue shock syndrome), which is thought to have an immune pathologic basis.¹

Over the past three decades, globally, there has been a dramatic increase in the frequency of Dengue fever (DF), dengue hemorrhagic fever (DHF) and dengue shock syndrome

(DSS). Approximately 2.5 billion people around the world live in dengue endemic countries of which 1.3 billion live in 10 countries of the South-East Asia Region which are dengue endemic area.²

An estimated 50 million infections including 250000-500000 cases of dengue haemorrhagic fever and 24000 deaths per year occur across approximately 100 countries. Approximately 500000 cases of DHF require hospitalization each year of whom a very large proportion are children and among them roughly 5% die. Nearly 90% of the dengue infections occur in children with a risk of dying during a second attack which is nearly 15- fold higher than that of adults. The management of dengue is essentially supportive. Without proper treatment, DHF-case-fatality rates can exceed 20%. With modern intensive supportive therapy, the rate can be reduced to less than 1%.³

In Bangladesh, the first documented case of dengue- like fever occurred in 1964 popularly known as "Dacca fever" which later on serologically proved as dengue fever.⁴ The magnitude of dengue fever was largely unknown until it took a heavy toll in 2000 (5,555 cases and 93 deaths); 2001(2,430 cases and 44 deaths); 2002 (6,104 cases and 58 deaths).²

The objectives of this study were to know the demographic profile, clinical features, serology and outcome of dengue patients admitted at Dhaka Shishu (Children) Hospital.

Methodology : This study was a prospective observational study carried out on suspected dengue fever patients who were admitted at Dhaka Shishu (Children) Hospital, during the period of June to December 2016. Children were 1 year to 18 years of age. After obtaining informed consent from the parents, a total of 78 children suspected dengue fever (based on clinical features) were primarily enrolled for this study. Patient with any identified specific infection or febrile illness more than 14 days and serologically dengue negative cases were excluded from the study.

Fifty six (56) serologically positive (NS1 antigen, IgM, IgG antibodies) dengue patients were finally selected for our study. Dengue serology (Rapid qualitative immune-chromatographic test -NS₁ antigen was done in patients who presented with fever for 3 days or of lesser duration and Dengue IgM and IgG were done in those who came with fever for more than 5 days.

The cases were classified according to WHO Comprehensive Guidelines for Prevention and Control of Dengue and Dengue Hemorrhagic fever, 2011. The variables recorded were demographic profile, clinical manifestations, laboratory parameters (complete blood count (CBC) including white blood

cell count (WBC), platelet count, PCV, SGPT and outcome of illness.

Data were collected in a predesigned structured questionnaire and recorded on MS excel sheet and were analysed with the help of SPSS 21 version.

Results : Among 78 suspected dengue cases 56 (71.8%) cases were serologically dengue positive. Therefore 22 (28.2%) serologically dengue negative cases were excluded from the study. Among the 56 serologically dengue positive patients 34 (60.72 %) were NS1 antigen positive, 14 (25%) IgM antibodies and 8(14.28%) both IgM and IgG antibodies positive. The distribution of the serologically dengue positive patients out of 78 clinically suspected cases were shown in Table I.

Table I: Distribution of the serologically dengue positive patients

	Number	percentage
Total serology positive	56	71.8
Total serology negative	22	28.2
Serological test	Positive	percentage
NS1 Ag	34	60.72
IgM	14	25.00
Both IgM and IgG	8	14.28

Among the study patients 31(55.44 %) were male and 25(44.56%) were female (fig. 1) ; 50 (89.3%) from urban and 6 (10.7%) rural area (fig. 2). The age of the children range from 1 year to 18 years with a mean age of 6.66 ±3.69 years. The age distribution of the patients are shown in Table II.

Fig 1: Gender distribution of the patients

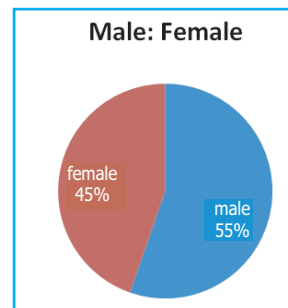


Fig 2 : Geographical distribution of the patient

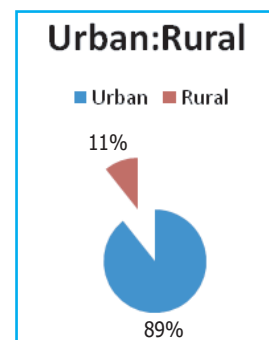
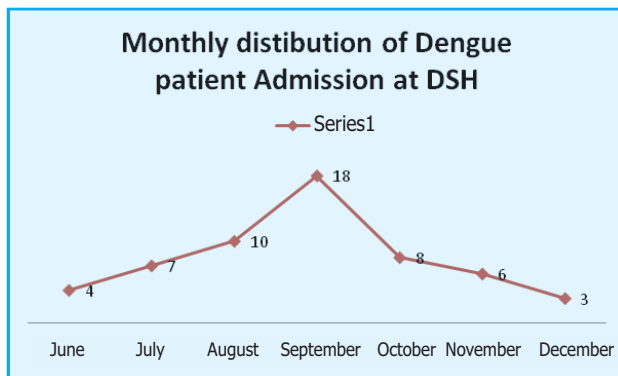


Table II : Age distribution of the patients

Age range	No. (%)	Total, No (%)
1 years-2years	7 (12.5%)	
3 years-5years	14 (25%)	
6 years-12 years	25 (46.4%)	
13years -18 years	10 (16.1%)	56(100%)

The number of the patients increased progressively from June to maximum in the month of September and then declined. The monthly distribution of the dengue patients is shown in figure 3.

Fig 3 : Monthly distribution of the Dengue patients Admission during study period at DSH

The common clinical manifestation were fever (100%), Myalgia (76.79%), headache (68.58%), arthralgia 62.55%, conjunctival haemorrhage 55.35%, Skin rash 55.3%, vomiting 51.79%, and itching 51.79 % and abdominal pain (46.43%). The clinical profile of the patients were shown in table III.

Table III: clinical features of the patients of dengue fever

Clinical features	No.	%
Fever	56	100
Myalgia	43	76.79
Retro – orbital pain	41	73.21
Headache	38	68.58
Arthralgia	35	62.55
Conjunctival hemorrhage	31	55.35
Skin rash	31	55.35
Itching	29	51.79
Vomiting	29	51.79
Abdominal pain	26	46.43
breathlessness	8	14.29

On laboratory investigations the mean Hb was 11.19gm/dl with SD ± 1.29 , mean WBC was 6111/cumm with SD ± 2843 /cumm and mean platelet count 94333/cumm with SD ± 68330 . The mean PCV was 35 with SD ± 3.95 , SGPT mean 210IU/L with SD ± 84 . The laboratory parameters of the serologically positive dengue patients were shown in Table IV.

Table IV : Laboratory parameter of the patients of Dengue fever

Parameter	Mean	SD
Hemoglobin gm/dl	11.19	± 1.290
Total WBC count per mm ³	6111	± 2843
Platelet count per mm ³	94333	± 68330
PCV	35	± 3.95
SGPT U/L	210	± 84

According to WHO Comprehensive Guidelines for Prevention and Control of Dengue and Dengue Hemorrhagic fever, 2011 our study patients were classified as Dengue Fever (DF)-42.86%, Dengue Hemorrhagic Fever-I (DHF-I)-32.14%, Dengue Hemorrhagic Fever-II (DHF-II)-16.07%, Dengue Hemorrhagic Fever-III (DHF- III)- 08.93% and Dengue Hemorrhagic Fever-IV (DHF-IV) were nil (Table-V).

Table V : Distribution patients according to WHO classification

WHO classification of dengue	No	%
DF	24	42.86
DHF-I	18	32.14
DHF-II	9	16.07
DHF-III	5	08.93
DHF-IV	00	00
Total	56	100

Outcome of the disease were 89.3% discharge with advice (DA), 7.1% discharge on request (DOR), 3.6% left against medical advice (LAMA) and no death (table VI).

Table VI : Outcome pattern of dengue patients

Discharge pattern	No	%
DA	44	78.56
DOR	7	12.40
Transfer to ICU	3	05.34
LAMA	2	03.70
Death	00	00

Discussion

In the present study, among 78 suspected dengue cases 56 (71.8%) cases were serologically dengue positive. Therefore these serologically dengue positive cases were selected for our study. Among the 56 patients 34 (60.72 %) were NS1 antigen positive, 14 (25%) IgM antibodies and 8(14.28%) both IgM and IgG antibodies positive. Isolated IgM and both IgM and IgG antibodies for dengue virus were positive in 17.95% and 10.25% of patients respectively which were much lower than that of Shahidul ABM et al's study findings (IgM and IgG antibodies for dengue positive in 40.7% and 24% cases

respectively and both positive in 31% cases).⁵

In the present study, the majority of the patients (46.4%) belong to the 1 years to 18 years age group with a male (55.44%) preponderance. Sarker et al⁶ (2012) and Ahmed et al⁷ (2001) reported that maximum number of cases were below 10 years.⁷

Both Gupta et al (2006) and Chakrabarti et al (2005) also reported maximum cases of male preponderance.^{8,9} The majority of the patients were urban residents, this might be due to the location of the hospitals in the urban areas, additionally, urbanization also favors vector breeding.

In our study we found that the number of the dengue patients increased progressively from the month of June to maximum in the month of September and then declined. The majority of the patients were reported during monsoon and post-monsoon seasons, in accordance with the earlier reports of the dengue transmission.¹⁰

The common presenting features of the patients were fever (100%), myalgia (76.79%), retro-orbital pain (73.21%), headache (68.58%), arthralgia (62.55%), conjunctival haemorrhage (55.35%), skin rash (55.35%), itching (51.79%), vomiting (51.79%) and abdominal pain (46.43%). These findings are quite similar to the observations of Shahidul ABM et al (2009) but differ from that of Ahmed et al (2001) and Rahman et al (2002).^{5, 7, 11} Both Ahmed et al (2001) and Rahman et al (2002) found headache was the most predominant signs, 85% and 91% respectively.^{7, 11}

In our study the rashes were 55.35% which was much lesser than that of Shahidul ABM et al (2009) and it was 75.9%.¹¹ In the present study the mean platelet count of the patients was 94333/mm³ which was below 1,00,000/mm.³ The mean PCV was found 35% and the mean SGPT was 210 U/L. These findings were all similar to the observations of Shahidul ABM et al (2009).⁵

There was no mortality in our study whereas it was 3.8% in Agarwal et al study (1996), 10.91% in Wali et al study (1997), 3.8% in Rahim et al study (2006) and 6% in ABM Shahidul ABM et al study (2009).^{5,12-14} In our study, DSS was a rare event, resulting in a lower case-fatality rate for dengue than reported elsewhere.

Conclusion

In our observation the incidence of dengue was more in male child, peak age group was being 6 years to 12 years with most admissions during the month of September. Fever with pain (body ache, retro orbital pain), headache and maculopapular rash, positive NS₁Ag, dengue IgM were the main findings found in children with dengue. Most of the dengue cases were DF and DHF-I in our study.

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