

## Study of Clinical Profile and Outcome of Dengue Fever in the Patients of Pediatric Age Group in Diphu Medical College and Hospital, Karbi Anglong, Assam

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Conflict of interest: Nil

### Abstract:

**Introduction:** Dengue is a vector borne disease caused by RNA virus of Flaviviridae family. It is spread by the bite of female Aedes mosquito. Dengue is characterized by onset of high grade fever with bodyache, myalgia, arthralgia, retrobulbar pain and its complications which might lead to even circulatory shock. It is a matter of concern particularly in Southeast Asian countries.

**Aim:** The aim of this study was to find out the clinical profile and outcome of dengue fever in children between the age group of 1 month to 12 years of age admitted in the Pediatric ward of Diphu Medical College located in the hill district of Karbi Anglong. There is dearth of publications on vector borne disease in children in this part of Assam and hence this study was taken.

**Methods:** This was done as a retrospective study and the period of study was from March 2022 to August 2023. All children presenting with fever, bodyache, rashes, vomiting, pain abdomen, dizziness, convulsion were tested for Dengue infection either by Antigen test (NS1) or Antibody test (IgM). The data obtained was entered in MS Excel and analyzed in the light of available literature. Ethical clearance was taken from the Institutional Ethical committee.

**Results:** Out of the 1803 number of patients admitted between 01/03/2022 and 31/08/2023 in the Pediatric ward of Diphu Medical College and hospital, 69 cases were found to be dengue positive.

**Conclusion:** Number of non-severe dengue cases (n=68) were more than the number of severe cases(n=1) in this study. Case Fatality Rate (CFR) was found to be 1.449%. Early detection of the disease can prevent the mortality and the morbidity associated with dengue.

**Keywords:** Aedes aegypti, Dengue fever, Bodyache, Rashes, DFH, DSS.

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### Introduction

Dengue is a vector borne disease caused by an RNA virus of 'Flaviviridae family'. It is transmitted by bite of an infected female Aedes mosquitoes (Aedes aegypti and Aedes albopictus) mosquito mainly during the rainy season. Flaviviridae is a arthropode-borne virus that includes four different serotypes (DEN-1, DEN-2, DEN-3 and DEN-4)[1].

Infection with one subtype provides lifelong immunity to that particular serotype and partial and temporary immunity to the other subtypes [1]. It is characterized by acute onset of fever, muscle and joint pain, rash, hemorrhage which may even lead to circulatory shock. Oral mucosal involvement is rare in dengue fever [2]. The word 'Dengue' originated from the Swahili phrase ka-dinga pepo, which explains that it is caused by an evil spirit. The Swahili word 'Dinga' has originated from

Spanish word dengue, meaning fastidious or careful which describes the gait of a person suffering from the bone pain of dengue fever [3]. In 1906, it was confirmed that 'Aedes' mosquito was transmitting the disease and in 1907, Dengue was found to be the second disease after Yellow fever that was caused by a virus [3]. First outbreak was reported in India in Kolkata in the year 1963[3]. Dengue fever and its complications dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS) is a matter of public health concern, particularly in Southeast Asian countries [4].

All serotypes of Dengue virus causes a wide spectrum of illness from subclinical manifestations to mild self-limiting dengue fever to serious clinical presentation such as DFH/DSS [5]. Most of the time, cases are mild and self-limiting and only

5% of the cases are seen to develop complications [6] Worldwide, the risk of dengue is in 129 countries, with actual 70% of the burden in Asia. National Vector Borne Disease Control Programme shows that the number of cases in India has crossed 63,000 till September 2022 and with 44 deaths [6].

### Materials and Methods:

This retrospective study was done at, Diphu Medical College and Hospital, a tertiary care centre, located in the hill district of Karbi Anglong, Assam. From 01/03/2022 to 31/08/2023. The subjects selected for this study were children between the age group of 1 month to 12 years of age, admitted in the Pediatric ward of Diphu Medical College and Hospital. Data was collected from the available hospital records. The age, duration of hospital stay, seasonal variations and clinical findings of the patients were selected as variables for the study, which were analyzed after entering into MS Excel. Ethical clearance was taken from the Institutional Ethical committee no-DMCH/EC/2022/105/2830 dated 20/09/2023.

**Inclusion criteria:** All children between the age group of 1 month to 12 years of age presenting with fever with body ache, headache, vomiting, loose motion, dizziness, convulsion, bleeding, shock and so forth, tested positive for dengue either by Antigen test (NS<sub>1</sub>) or by Antibody test, ELISA (IgM) has been included in the study.

**Exclusion Criteria:** All children between the age group of 1 month to 12 years of age presenting with fever, but found negative for Dengue when tested were excluded from the study.

**Discharge Criteria:** All the dengue positive patients whose platelet counts were >100,000, defervence of fever for last 24 hours and whose oral intake was good without vomiting.

### Results

During the study period, 69 cases of Dengue were diagnosed, out of which 68 cases were non-severe

dengue (Undifferentiated fever, dengue fever with warning signs, and dengue fever without warning signs) and only 1 case was diagnosed to be severe dengue, presenting with bleeding from various sites of the body (DHF and DSS), according to WHO guidelines [1,2]. There were 43(62.316%) males and 26(37.679%) females in our study. The mean age, that was affected was 8.26±3.10 (SD=3.10) years.

Maximum number of children affected were in the age of group 8.5-10.5 years with male (n=15) 21.739% and female (n=11) 15.942%, followed by age group between 10.5-12.5 years with male (n=11) 15.942% and female (n=6) 8.695% respectively (Table 1). The average duration of hospital stay was 2.8±1.6 days. (Table 2). Fever was present in all (100%) the cases, loose motion in 19 cases with a percentage of 27.536%, vomiting in 14 cases with a percentage of 20.289%, bodyache and headache were present in 11 cases with a percentage of 15.942% each.

Bleeding from multiple sites (nose, mouth and urinary bladder) was noted in 1 case with a percentage of 1.449 %. Convulsion was seen in none of the cases while dizziness was seen in 5 cases with a percentage of 7.246%. Rash associated with itching was noticed in 6(8.695%) patients and 3(4.347%) patients presented with hepatomegaly. Clinical presentation observed has been given below (Table 3). Most of the cases were admitted during the month of July to December, recording the peak in the month of November with 20, cases (28.985%). Least number of cases were seen in the month of June, 3 cases (4.347%) (Table 4).

The percentage of non-severe dengue was 98.55% and the discharge rate was found to be 98.55% (Table 5). Platelet counts were more than 1 lakh/cmm in 68 cases and only one patient had a platelet count of 2,000/cmm and who presented with DSS and expired within 24 hours of hospital stay. Case fatality rate was found to be 1.449% (Table 6)

**Table 1: Demographic characteristics (n=69)**

Age(In years)	Male		Female	
	No. of cases (n)	Percentage (%)	No. of cases(n)	Percentage (%)
<1	1	1.449	0	0
1-2.5	3	4.347	1	1.449
2.5-4.5	2	2.898	4	5.797
4.5-6.5	5	7.246	1	1.449
6.5-8.5	6	8.695	3	4.347
8.5-10.5	15	21.739	11	15.942
10.5-12.5	11	15.942	6	8.695
Mean age=8.26±3.10 years	Total=43	62.316	Total=26	37.679

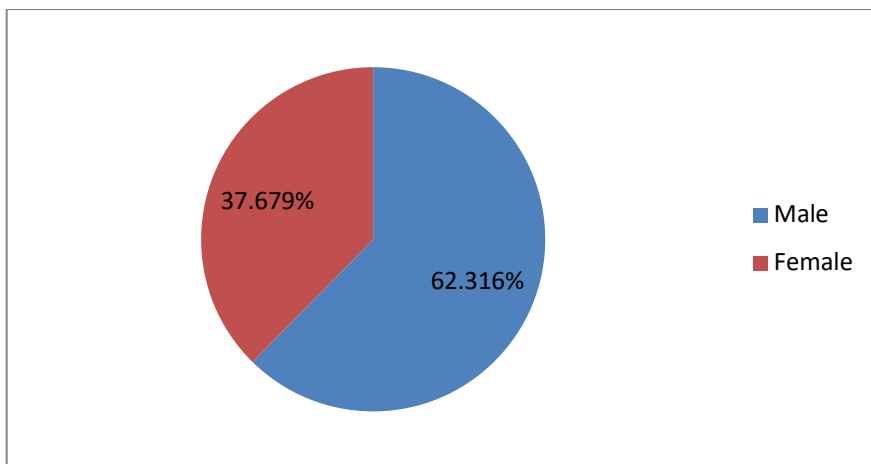


Figure 1: Male and female percentage

Table 2: Duration of Hospital stay

No. of days of hospital stay(in days)	No. of patients(n)	Mean duration of Hospital-stay 2.8±1.6 days
1	13	
2	23	
3	13	
4	12	
5	5	
6	-	
7	2	
8	-	
9	1	

Table 3: Common presenting symptoms

Symptom	No. of cases(n)	Percentage (%)
Abdominal pain	3	4.347
Loose motion	19	27.536
Vomiting	14	20.289
Headache	11	15.942
Bodyache	11	15.942
Bleeding	1	1.449
Convulsion	0	0
Dizziness	5	7.246
Fever	69	100
Rash	6	8.695
Hepatomegaly	3	4.347

Table 4: Month wise distribution of dengue cases

Month	No. of cases(n)	Percentage (%)
January	0	0
February	0	0
March	0	0
April	0	0
May	0	0
June	3	4.347
July	14	20.289
August	16	23.188
September	7	10.144
October	4	5.797
November	20	28.989
December	5	7.246

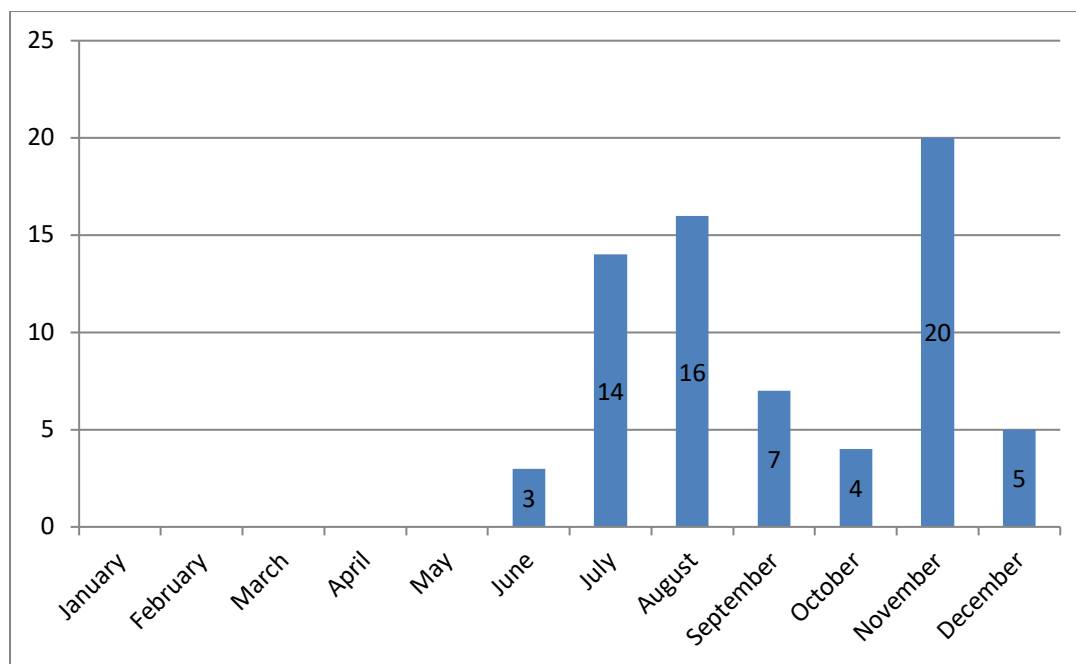


Figure 2: Seasonal pattern of dengue cases

Table 5: Type of dengue vs clinical outcome

Type of dengue	Discharged		Expired		Total	%
	n	%	n	%		
Non-severe Dengue	68	100	0	0	68	98.550
Severe Dengue(DHF+DSS)	0	0	1	100	1	1.449
Total	68	100	1	100	69	100

NB- Percentage in the table is column wise.

Table 6: Platelet count vs clinical outcome

Platelet count	Discharged		Expired		Total	%
	n	%	n	%		
>1lakh	68	100	0	0	68	98.550
< 50 thousand	0	0	1	100	1	1.449
Total	68	100	1	100	69	100

NB- Percentage in the table is column wise.

**Discussion:**

In this study, males were more affected than the females, similar to the results found in [7,9,10]. This was probably because more importance is given to the male child in our society and hence early seeking of medical help. The mean age of the patients admitted in our study was 8.26±3.10 years, similar to [7,8,11]. More number of children in the older age group was affected and this might be probably that, children in this age group have more chances of outdoor activities than the younger ones. Number of non-severe cases 68(98.55%) were more than the number of severe case 1 (1.449%), similar results were seen in [7,9,11].Fever was seen in 100%(69) of the cases and involvement of GIT system i.e. ,vomiting, pain abdomen, skin rash, was seen in our study which was similar to the studies done by [7,11,19]. The duration of hospital stay in our study (2.8±1.6 days) was similar to other study

[12]. This may be explained by the fact that more cases of non-severe cases 68 (98.55%) were admitted and seeking of prompt medical help lead to the early recovery of the patients. 1(1.449%), case of severe dengue (DSS) expired which was similar to the result of [12]. Discharge rate 68 (98.55%) was found to be similar with that of other studies [12]. The discharge rate was more as the cases were mostly non-severe cases. The peak season was found to be November similar to [13]. Studies by Singh P.S. et al[14] observed that dengue infection was found to be most between August-October while Morales I et al[15] observed that dengue rate was more between August and September. This seasonal variation may occur due to mean temperature and precipitation level which may affect the extrinsic incubation period and replication of the dengue. The post-monsoon collection of stagnant water could favor the breeding of mosquito vector and thus resulting in increase number of cases during this period similar

to that seen by [16,17]. The season where cases were seen least was June. 1 severe dengue case expired within 24 hours of hospitalization amounting to a Case Fatality Rate rate of 1.449%.

This may be due to delay in seeking medical help. Case fatality was found to be 0.5% by [18]. No mortality was noticed by [19]. This difference may be due to small sample size of our study and hence not reflecting the actual CFR.

#### Conclusion:

Prompt detection and seeking early medical help prevents the severity of the disease and hence the mortality and morbidity. The control programs and surveillance would definitely help in reducing the burden of dengue.

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**Limitation of the study:** This was a hospital based retrospective study and the number of cases was less, hence the actual incidence rate may differ from that of the community level. Moreover only those cases presenting with fever were tested for antigen NS<sub>1</sub> or antibody IgM, therefore there are chances that some cases presenting with unusual clinical presentation might have been missed at the time of testing. The study period taken is short and the number of cases is not sufficient to comment regarding the spectrum of the disease.

#### Abbreviations:

- WHO: World Health Organization
- DHF: Dengue Haemorrhagic Fever
- DSS: Dengue Shock Syndrome
- ELISA: Enzyme linked immunoassay
- GIT: Gastro-Intestinal Tract
- CFR: Case Fatality Rate

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