

A Study on Clinical and Laboratory Profile of Dengue Fever in a Tertiary Care Hospital in Assam, India

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ABSTRACT

Objective: Dengue is one of the most important emerging mosquito-borne viral disease, afflicting humanity in terms of morbidity and mortality. This study was designed to assess the clinical and laboratory profile of patients with dengue infection.

Methods: It is a prospective observational study, which was undertaken among admitted adult patients in a tertiary care hospital. A total of 53 patients, who were NS₁ antigen/ MAC-ELISA positive for dengue, were included in this study. Their clinical features and laboratory profiles were studied.

Results: Of the 53 patients studied, majority were male. Fever (100%) was the major symptom followed by headache/retro-orbital pain (71.69%), myalgia (64.15%), arthralgia (52.83%), rash (26.21%), skin haemorrhage (26.21%), abdominal pain (22.6%), vomiting (18.86%), itching (18.86%), loose motion (16.98%), gum bleed (16.98%), epistaxis (15.09%), hepatomegaly (15.09%), pleural effusion (5.66%) and ascites (7.55%). Thrombocytopenia, leucopenia and deranged liver transaminases were significant laboratory abnormalities.

Conclusion: Fever associated with headache, retro - orbital

pain, myalgia, arthralgia, rash, itching along with thrombocytopenia, leucopenia and deranged liver transaminases, in tropical and subtropical regions, especially during the monsoon and post-monsoon seasons, should raise the suspicion of dengue fever.

Keywords: Dengue, Thrombocytopenia, Leucopenia.

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INTRODUCTION

In recent years dengue has become a major global health concern. About half of the world's population, in tropical and subtropical climates world-wide, mostly in urban and semi-urban areas, is now at risk.¹ In India, the first confirmed dengue fever outbreak occurred in 1963. The resurgence of dengue has been observed in India. Dengue outbreaks are frequently reported from different parts of India, mainly from urban and semi-urban areas. Dengue is a mosquito-borne viral illness caused by one of the four serotypes of dengue virus, belonging to the family flaviviridae. The virus serotypes though genetically closely related yet are antigenically distinct. Recovery from infection by one of them provides life-long immunity against that particular serotype. However, cross-immunity to other serotypes after recovery is only partial and temporary. Subsequent infections by other serotypes increase the risk of developing severe dengue¹. Dengue infections vary in severity, ranging from influenza-like self-limiting illness to life-threatening dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS) which, if left untreated, are associated with mortality as high as 20%.

AIMS AND OBJECTIVES

To study the clinical and laboratory profile of the serologically confirmed cases of dengue fever admitted in the Department of Medicine of Gauhati Medical College and Hospital, Guwahati, Assam, India.

MATERIALS AND METHODS

It is a single centre hospital based prospective observational study. Patients with dengue infection (serologically confirmed cases), admitted in the department of Medicine, Gauhati Medical College & Hospital during the period August 2015 till October 2015, were included in this study. The diagnosis of dengue infection was based on clinical presentation and a positive NS₁ antigen and/or IgM antibody detected by ELISA-based method. Patients with concurrent infections with malaria, enteric fever were excluded from the study. Written informed consent from the patient/guardian was taken. Patients were examined according to a predesigned protocol containing demographic information, thorough history, complete clinical examination and investigations.

Investigations included complete blood count, PBS for MP, Rapid card test for Pf and Pv antigen, widal test, urine R/E, stool for occult blood, blood sugar, liver function test, renal function test. Chest X ray, USG abdomen, CT head ABG and other relevant investigations, were carried out if found necessary. Patients were followed up on daily basis during their hospital stay.

Table 1: Age group distribution

Age groups (in years)	Male	Female	Total	Percentage
13-20	7	4	11	20.75
21-30	21	5	26	49.06
31-40	9	1	10	18.86
41-50	3	1	4	7.54
51-60	1	0	1	1.89
61 and above	1	0	1	1.89

Table 2: Sex distribution

Male	42	79.25%
Female	11	20.75%

Table 3: Clinical features

Sl No	Signs/Symptoms	Frequency (%)
1	Fever	53 (100%)
2	Headache/Retro-orbital pain	38 (71.69%)
3	Myalgia	34 (64.15%)
4	Arthralgia	28 (52.83%)
5	Skin rash	14 (26.21%)
6	Skin Haemorrhage	14 (26.21%)
7	Abdomianl pain	12 (22.64%)
8	Vomiting	10 (18.86%)
9	Itching	10 (18.86%)
10	Looose motion	9 (16.98%)
11	Gum bleed	9 (16.98%)
12	Epistaxis	8 (15.09%)
13	Hepatomegaly	8 (15.09%)
14	Ascites	4 (7.55%)
15	Pleural Effusion	3 (5.66%)

Table 4: Haemoglobin distribution

Hb	No. of patients	Percentage
<6 gm%	2	4.08%
6-10 gm%	16	32.6%
>10-16 gm%	29	59%
>16 gm%	2	4.08%

Table 5: Haematocrit distribution

Hematocrit	No. of patients	Percentage
≤45%	44	83.02%
>45%	9	16.98%

Table 6: TLC distribution

<4000/cmm	16	30.19%
4000-11000/cmm	36	67.92%
>11000/cmm	1	1.89%

Table 7: Platelet distribution

<20000/cmm	2	3.77%
20000 to 50000	9	16.98%
>50000 to <100000	18	33.96%
>=100000 to 150000	19	38.84%
>150000	5	9.43%

Table 8: Liver function test

Sr. bilirubin	<2mg/dl	49
	2-5mg/dl	4
	>5mg/dl	0
AST	<45 U/L	5
	45-200 U/L	36
	>200 U/L	12
ALT	<45 U/L	8
	45-200 U/L	35
	>200 U/L	10

RESULTS

In our study of 53 dengue fever cases, the male to female ratio was 3.8. Mean age of the cases was 29.39 years (SD 10.59, range 15 to 69). Almost half of the patients (49%) were between age group of 21-30 years, closely followed by age group of 31-40 (20.75% and 18.86% respectively). Maximum patients (88.67%) were from urban areas (urban to rural ratio was 7.8). The mean duration of illness at the time of admission was 4.75 days (SD 1.76, range 2-10 days) and the mean duration of hospital stay was 4.45 days (SD 1.55, range 2-8 days).

Clinical Features

The most common clinical presentations were fever (100%), headache/retro-orbital pain (71.69%), myalgia (64.15%) arthralgia (52.83%), rash (26.21%), skin haemorrhage (26.21%), abdominal pain (22.64%), vomiting (18.86%), itching (18.86%), gum bleed (16.98%), loose motion (16.98%) and epistaxis (15.09%). Hepatomegaly was found in 15.09% of the cases, while ascites (7.55%) and pleural effusion (5.66%) were found only in a few cases.

LABORATORY FINDINGS

Haemoglobin (Hb) distribution

Hb value of less than 6 gm% was seen in 2 cases. Hb was in the range of 6-10 gm% in 16 (32.6%) cases and in rest of the cases it was above 10 gm%. 2 patients were found to have Hb value of more than 16 gm%.

Total leucocyte count (TLC) distribution

Complete blood counts showed leucopenia (<4000/cmm) in 16 cases (30.19%) and leucocytosis in 1 case while the rest had normal counts. Relative monocytosis and eosinophilia were found in 27 cases (50.94%) and in 15 cases (28.3%) respectively.

Platelet count distribution

Platelet count was done on automated cell counter on daily basis. In case of thrombocytopenia, the platelet count was re-evaluated manually. Platelet counts were decreased below 1 lac/cmm in 29 cases (54.7%). 16.98 % cases had thrombocytopenia in the range of 20000-50000/cmm and in 3.77% cases the counts were below 20000/cmm. Six patients with thrombocytopenia and spontaneous mucosal bleeding needed therapeutic intervention with platelet

transfusion. Among 16 cases of leucopenia, 9 cases had thrombocytopenia (56.25%) and among 36 cases with normal leucocyte count, 20 cases had thrombocytopenia (55.55%). So in our study, no correlation has been found between leucopenia and thrombocytopenia. In most of the cases with thrombocytopenia, it has been observed that the platelet count starts falling from as

early as 3rd day of the onset of symptoms and starts recovering by 7th to 9th day.

Liver function tests

Out of 53 cases, 4 cases had shown mild rise of serum bilirubin (2-5 mg %) while 48 cases (90.5 %) and 45 cases (84.9 %) had reported rise of AST and ALT respectively as shown in Table 7.

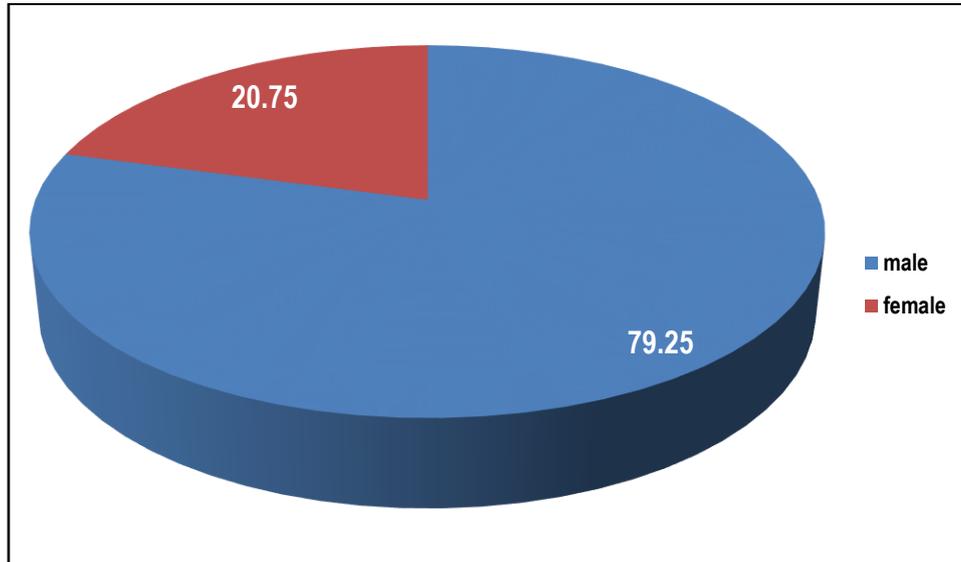


Figure 1: Sex distribution (In percentage)

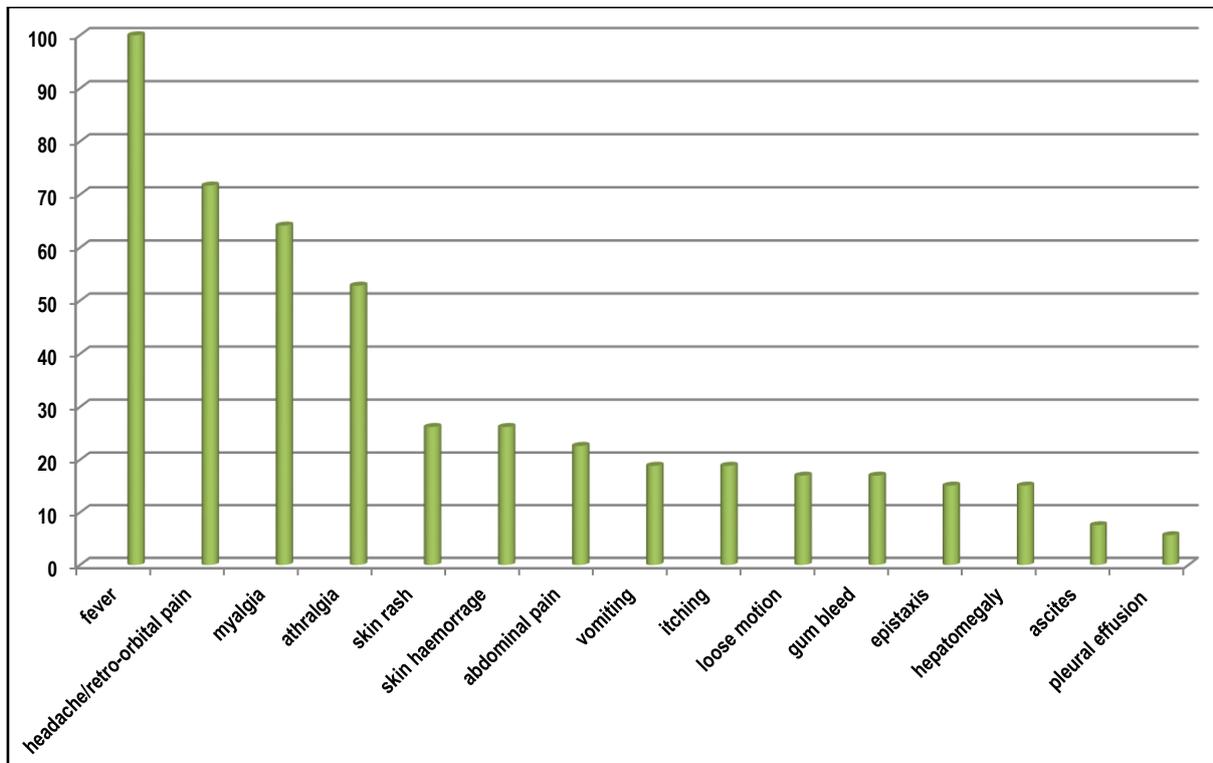


Figure 2: Clinical features (In percentage)

DISCUSSION

Maximum number of the cases were reported in the month of September (54.71%), followed by October (28.3%) and August (18.87%). During the monsoon season, which extends here from July to September, there is abundant rainfall and high humidity with daily temperature reaching about 26^o to 30^o C. These climatic conditions provide a favourable environment for mosquito breeding.² This study revealed a male predominance in dengue

infection, which may be owing to the increased outdoor activities of the males in this part of the region compared to the females. Besides, the females stayed more of their time indoors and their clothing covered a greater part of their bodies and these gave them additional protection compared to the males.³

In this study, we have found fever to be the commonest symptom in dengue patients, followed by headache/retro-orbital pain (71.69%) and myalgia (64.15%). Other prominent symptoms were

arthralgia, skin rash, skin haemorrhage, loose motion, mucosal bleed and nausea/vomiting. These findings are comparable to those documented by others, though the frequencies of the symptoms varied slightly.⁴⁻⁹ In our study, itching, especially in the palms and soles, was noted in 18.86 % of patients which was comparable to similar study by Rajesh Deshwal et al.⁸ In majority of these patients, itching appeared with defervescence.

The current study showed leucopenia in over 30% cases. The lowest leucocyte count was 2010/cmm. Leucopenia has been reported among dengue patients in many studies.^{2,7,10}

In the present study, thrombocytopenia (<1.5 lacs/ μ L) was observed in 90% of the cases. Platelet count <1 lac/cmm was observed in 54.7% of the cases. Moderate thrombocytopenia (20000-50000/cmm) and severe thrombocytopenia (<20000/cmm) were found in 16.98% and 3.77% of the patients respectively. Bone marrow suppression, immune-mediated clearance and spontaneous aggregation of platelets to virus infected endothelium may be responsible for such thrombocytopenia. Similar studies have earlier reported thrombocytopenia in dengue patients, though the incidence varied marginally.¹¹⁻¹⁴

Raised liver transaminases were noted in majority of the patients (90.56%). AST > 200 U/L was noticed in 22.6% of cases. Mandal et al, in a similar study, documented elevated transaminases in 83.78% of the cases.^{7,10}

Pleural effusion on chest radiography and ascites on ultrasonography, were found in 3 (5.66%) and 4 (7.55%) patients respectively which is marginally lower than that reported by other studies.^{2,11} Patients were managed by standard protocol and there was no mortality in our study.

CONCLUSION

Dengue infection is increasing substantially with un-planned rapid urbanization, high population density and poor waste management. Fever associated with headache, retro-orbital pain, myalgia, rash, itching along with leucopenia, thrombocytopenia and deranged liver transaminases, in tropical and subtropical regions, especially during the monsoon and post-monsoon seasons, should raise the possibility of dengue fever.

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