

## Original Research Article

# Study of clinical and laboratory profile of dengue fever in a tertiary care hospital

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## ABSTRACT

**Background:** Dengue fever is one of the most common arboviral mediated outbreaks reported with increased prevalence over the last few years with considerable morbidity and mortality. This study was designed to study the clinical and biochemical parameters in dengue fever patients.

**Methods:** Prospective observational study was undertaken among adult patients in a tertiary care hospital. fifty patients were studied and analysed. All patients who were NS1 (Non-Structural Protein 1) antigen or IgM dengue positive were included in the study. Clinical features, haematological and biochemical parameters were noted.

**Results:** Of the 50 patients studied, majority were males (68%). Fever was the major symptom (100%) followed by Body ache (84%), Headache (64%), Retro-orbital pain (52%), Myalgia (48%), conjunctival injection (40%), Itching (40%), abdominal pain (36%), Bradycardia (34%), Rash (30%), pleural effusion and ascites both seen in (28%). Significant derangements in platelet (76%), leucocyte counts (84%) and serum transaminases (58%) were noted.

**Conclusions:** Fever associated with headache, retroorbital pain, erythematous morbilliform rash, conjunctival injection and itching over palms and soles along with thrombocytopenia, leukopenia, elevated liver transaminases should prompt a clinician on the possibility of dengue infection. Platelet transfusions have little role in management of dengue patients unless patients having active bleeding secondary to thrombocytopenia due to dengue fever.

**Keywords:** Bradycardia, Dengue fever, Headache, NS1 antigen, Thrombocytopenia

## INTRODUCTION

Dengue is the most common arthropod born viral (arboviral) illness in humans. Globally, 2.5-3 billion individuals live in approximately 112 countries that experience dengue transmission. Annually, approximately 50-100 million individuals are infected.<sup>1</sup> The incidence has increased manifold in india due to unplanned urbanization and migration of population to urban areas. Although initially reported from urban locales, dengue is now being reported from urban and rural backgrounds also. Dengue is caused by infection with one of the four serotypes (DENV-1, DENV-2, DENV-3, DENV-4) of dengue virus, which is a Flavivirus. Infection with one dengue serotype confers lifelong

immunity to that particular serotype and a very brief period of partial heterotypic immunity to other serotypes,<sup>2</sup> but a person can eventually be infected by all 4 serotypes.<sup>2</sup> Several serotypes can be in circulation during an epidemic. Dengue is transmitted by mosquitoes of the Genus *Aedes*, principally *Aedes Aegypti*.<sup>3</sup> Initial dengue infection may be asymptomatic (50-90%), may result in a nonspecific febrile illness, or may produce the symptom complex of classic Dengue Fever (DF).<sup>4</sup> Classic dengue fever is marked by rapid onset of high fever, headache, retro-orbital pain, diffuse body pain (both muscle and bone), weakness, vomiting, sore throat, altered taste sensation, and a centrifugal maculopapular rash among other manifestations. A small percentage of persons who have previously been

infected by one dengue serotype develop bleeding and endothelial leak upon infection with another dengue serotype. This syndrome is termed Dengue Hemorrhagic Fever (DHF). The exact clinical and laboratory profile is crucial for diagnosis as well as successful management of the patients. This study is an attempt to elucidate the clinical and laboratory profile of serologically confirmed cases of dengue fever in author's hospital.

## METHODS

This prospective observational study was carried out in a tertiary care hospital specially during rainy season from August to October 2019. patients who got admitted in Medicine male ward and Medicine female ward during this period with dengue like symptoms tested with dengue NS1 and Ig M test. Total 50 patients enrolled in study.

### Inclusion criteria

- All patients above 18 years with confirm dengue, who were either NS1 (nonstructural protein) antigen and/ or IgM dengue antibody positivity included in the study.

### Exclusion criteria

- The patients having co-infection with Malaria, Typhoid, Leptospirosis etc were excluded from the study.
- Patients having comorbidities like Diabetes, Hypertension, Ischaemic heart diseases excluded from the study.
- Patients not willing to give consent excluded from study.

Detailed history and careful clinical examination were performed on each patient. Laboratory investigations done were hemoglobin, total leucocyte count, platelet count, hematocrit, liver function tests, blood urea and serum creatinine, chest radiograph and ultrasound scan of abdomen. patients watched for any bleeding manifestations in the form of epistaxis, melena or bleeding from any other natural orifices. patients monitored for hypotension and adequate fluid resuscitation done. Blood counts were monitored regularly till the recovery and clinical improvement in patients. Other differential diagnosis was excluded by appropriate tests. Informed consent was obtained from each patient.

## RESULTS

A total of 50 patients who reported between August to October 2019 were studied and analyzed. Majority of these cases reported to author's hospital coinciding with rainy season, showing the breeding of mosquitoes during the period. Patients of age more than 18 years enrolled in study. Majority of the patients were males (68%).

Females formed 32% of the study. Maximum patients were in 18-25 age group (48%), followed by 26-40 age group (20%). elderly patients found affected (14%) less than younger age group (Table 1).

**Table 1: Age and sex wise distribution.**

Age (years)	Male 34(68%)	Female 16(32%)	Total N(%)
18-25	16	8	24(48%)
26-40	8	2	10(20%)
41-60	5	4	9(18%)
> 60	5	2	7(14%)

**Table 2: Clinical features.**

Clinical features	No of patients (%)
Fever	50(100%)
Body ache	42(84%)
Headache	32(64%)
Retroorbital pain	26(52%)
Myalgia	24(48%)
Conjunctival injection	20(40%)
Itching	20(40%)
Abdominal pain	18(36%)
Bradycardia	17(34%)
Rash	15(30%)
Pleural effusion	14(28%)
Ascites	14(28%)
Bleeding	4(8%)

Fever was present in all patients followed by bodyache (84%), headache (64%), retro-orbital pain (52%), myalgia (48%), conjunctival injection (40%), itching (40%), abdominal pain (6%), bradycardia (34%), skin rash (30%), predominantly localized to palmar and plantar aspects of hands and feet. Pleural and ascitic fluid exudation both was present in 28% of cases, while bleeding in form epistaxis, melena was seen in 8% of cases (Table 2).

**Table 3: Lab parameters.**

Parameter	No of patients (%)
Thrombocytopenia (platelets <1 lac)	38(76%)
Leucopenia (<4000)	42(84%)
Raised AST, ALT (>45)	29(58%)
Raised hematocrit (>45)	24(48%)

Platelet count on admission was less than 1 lac in around 76% of cases then it further dropped during admission course, Minimum platelet count noted was 6000/cumm. Leucopenia was noticed in around 84% of cases. Raised liver serum transaminases were noted in 58% of patients. Raised hematocrit (>45%) was noted in 48% of patients (Table 3).

## DISCUSSION

Over the past few years there has been increase in number of dengue cases due to rapid increase in construction activities and poor sanitation and drainage system contributing fertile breeding areas for mosquitoes, it is also seen that increase in alertness among medical personnel following the epidemics and availability of diagnostic tools in the hospitals have contributed to the increased detection of cases.<sup>5</sup> Most common age group which affected by dengue mosquito was in the age group of 18 to 25 years. Fever was the most common presentation (100%), which is also seen in other similar studies from India and South East Asia.<sup>6</sup> Headache and rash seen in 64% and 30% of cases. Mandal et al, in a similar study have documented headache in 62.16% and rash in 37.84% of cases.<sup>7</sup> Munde et al, in their series of patients have shown myalgia in 50% and headache in 25% of all patients.<sup>8</sup>

Itching was noticed in 40% of this cases and most of them noticed at recovery phase of dengue, when platelets starts increasing, this finding has not been noticed by most other studies except a few, Rachel et al, from their study in Kollam, Kerala have documented pruritis in 10.4% of their patients.<sup>9</sup>

Conjunctival injection seen in 40% of cases in this study. Muniraja et al, documented conjunctival injection in 2.6 to 7.3% of cases which is much less than this study patients.<sup>10</sup>

Dengue virus interacts with host cells, causing release of cytokines and stimulation of immunologic mechanism causing vascular endothelial changes, infiltration of mononuclear cells and perivascular edema.<sup>11</sup> Pleural effusion documented in 28% on chest radiography and ascites also seen in 28% of patients on ultrasound scan of abdomen was marginally higher from other similar studies.<sup>10</sup>

Bleeding in the form of epistaxis and melena found in 8% of patients which is in the line of some other similar studies like Shabid et al, from Karachi.<sup>12</sup>

Bleeding diathesis is a known feature of dengue fever because of low platelet count and leakage from blood vessels. Bone marrow suppression, immune mediated clearance and spontaneous aggregation of platelets to virus infected endothelium may be responsible for such thrombocytopenia. Raised liver transaminases were found in 58% of cases. In study by Kularatne et al, 88% patients showed elevated ALT and AST, with 122 of them having two-fold increase.<sup>13</sup> Mandal et al, documented elevated transaminases in 83.78% of cases.

There was no mortality in this study. Higher mortality rates shown in other studies could be due to re-infection and late presentation to the hospital.

## CONCLUSION

Dengue infection is increasing proportional to increased urbanization and compromised sanitation and drainage measures. Patients who comes with fever, body ache, conjunctival injection and rash should prompt a clinician on the possibility of dengue infection. Platelet transfusions have little role in management of dengue patients unless there is active bleeding secondary to thrombocytopenia due to dengue fever. Early diagnosis, careful monitoring of patients, Paracetamol for fever and proper fluid management remains the mainstay treatment of dengue fever.

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