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## Original Research Article

## A study on clinical profile and laboratory parameters of dengue fever patients in Chennai, Tamil Nadu, India

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## ABSTRACT

**Introduction:** Dengue fever is the most important mosquito-borne viral disease, found to be endemic in tropical and subtropical countries. In recent decades, the incidence of dengue infection has increased around the world and has become a major public health concern.

**Materials and Methods:** The prospective study was conducted during the period from July 2018 to December 2020 at Sri Muthukumaran Medical College, Hospital & Research Institute, Chennai, India. All the Serum samples were collected with clinically suspected cases of Dengue and then it was confirmed by (NS1 antigen, IgM & IgG antibody) rapid serological test kit. All the clinical details & Hematological parameters were also recorded.

**Result:** During the study period, a total of 434 patients were suspected to have the Dengue infection. Majority of the cases were males 268 (62%) rather than Females 166 (38%). 146 (34%) samples were found to be positive for Dengue viral infection. Fever is the most common clinical presentation which was found in all the patients, followed by headache (56%), vomiting (52%), body pain (33.2%), Myalgia (32%), Joint pain (31.5%), Dry cough (29%), Nausea (22%), Abdominal pain (20%), Diarrhea (13%), Retro orbital pain (10%), Burning Micturition (8.2%), Hemoptysis (2.7%), and Rashes (0.2%). Hematological parameters such as Thrombocytopenia were 36 (24%), followed by Leucopenia 16 (11%), and raised Hematocrit 11 (7.2%).

**Conclusions:** Study has revealed that clinical manifestation is varied considerably from fever, myalgia to life threatening situations like dengue hemorrhagic fever or dengue shock syndrome if not treated on time. Therefore, early recognition and prompt management is required to decrease the morbidity and mortality of illness.

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### 1. Introduction

Dengue fever is the most important mosquito-borne viral disease, which were found to be endemic in tropical and subtropical countries (World Health Organization; 2013).<sup>1</sup> In recent decades, the incidence of dengue infection has increased around the world and has become a major public health concern.<sup>2</sup> There are four different serotypes of dengue virus; DENV-1, DENV-2, DENV-3 and DENV-4 that are responsible for dengue viral infection.<sup>3</sup> All

the serotypes can be in circulation during an epidemic.<sup>4</sup> Dengue is transmitted by mosquitoes of the genus *Aedes*, principally *Aedes aegypti*.<sup>5</sup> Dengue Fever is an acute febrile illness with headache, retroocular pain, muscle pain, joint pain, and rash; even though warningsigns and symptoms could also be presents with lymphadenopathy, petechial, nausea, hepatomegaly, and hemorrhage.<sup>6</sup> The identification of Dengue cases is possible by distinct clinical features but they can present with varied manifestations.<sup>7</sup> The exact clinical and laboratory profile is crucial for diagnosis as well as successful management of the patients. With this

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background the present study was done to evaluate the clinical profile and laboratory findings of serologically confirmed cases of Dengue fever.

## 2. Materials and Methods

This was a prospective study conducted during the period from July 2018 to December 2020 at Sri Muthukumaran Medical College, Hospital & Research Institute, Chennai, India. Informed consent was obtained from each patient and the study was approved by Institutional Ethical Committee. All the Serum samples were collected with clinically suspected cases of Dengue and then it was confirmed by (NS1 antigen, IgM, IgG antibody) rapid visual immunochromatography based test (J. Mitra and Co. Pvt. Ltd.). All the clinical data detailed history was obtained and clinical examination was performed on all the suspected cases. Hematological parameters such as Platelet count, Haemoglobin, Hematocrit (HCT) levels, Complete blood count (CBC), and White blood cell count (WBC) were also recorded.

## 3. Result

In our study period, a total of 434 patients were suspected to have the Dengue infection and majority of the cases were males 268 (62%) rather than Females 166 (38%). In which 146 (34%) samples were found to be positive for Dengue viral infection by rapid card test (NS1 antigen, IgM, IgG antibody). Throughout study population, highest numbers of positive cases for Dengue were screened in the year of 2019 (26%), followed by 2018 (4%) & 2020 (3.8%) shown in [Table 1]. Out of the total suspected cases of Dengue, 207 (48%) were adult age group of 16 to 44 yrs followed by the younger age group <15 yrs 90 (21%) [Table 2]. In our study the majority of the patients were positive for NS<sub>1</sub> Ag 125 (85%) followed by IgG 15(10%) and IgM 4 (2.7%) shown in [Table – 3]. Fever was the most common clinical presentation which was found in all the patients (100%) followed by Headache (56%), vomiting (52%), body pain (33.2%), Myalgia (32%), Joint pain (31.5%), Dry cough (29%), Nausea (22%), Abdominal pain (20%), Diarrhea (13%), Retro orbital pain (10%), Burning Micturition (8.2%), Haemoptysis (2.7%), and Rashes (0.2%) was shown in [Table 4]. Hematological parameters such as Thrombocytopenia patients were 36 (24%), followed by Leucopenia 16 (11%), and raised Haematocrit 11 (7.2%) shown in [Table 5].

## 4. Discussion

Dengue is an important emerging disease which was increasing over the past few years. This is due to increased urbanization and compromised sanitation measures. India is one of the countries in the South-East Asia region regularly reporting incidence of DF/DHF outbreaks due to

**Table 1:** Year wise Distribution of Dengue cases during the study period

Year	Positive	Negative	Total no. of patients (N=434)
2018	17 (4)%	73	90 (21%)
2019	113 (26%)	38	151 (35%)
2020	16 (3.8%)	167	193 (44%)

**Table 2:** Age and sex wise Distribution of Dengue cases (N=434)

Age Groups	Males	Females	Total No. of Patients (n = 434)
<15	81	32	113 (26%)
16 – 44	123	84	207 (48%)
45 – 60	47	25	72 (17%)
> 60	27	15	42 (10%)

its high incidence which constantly threatens the health care system.<sup>8</sup> In our study we found that highest positives cases were seen in the year of 2019, 113 (26%) followed by 2018, 17 (4) % which were similar to that of previous study.<sup>9</sup> Majority of the cases were found at the age group of 16–44 years, followed by 45 – 60 years. In our study, males 268 (62%) were predominant rather than Females 166 (38%). These findings are well coinciding with the previous study reported.<sup>10,11</sup>

Out of 434 samples of clinically suspected Dengue cases, 146 (34%) were found to be positive by rapid card test which is similar with Mohamed Murtuza et al study.<sup>12</sup> Majority of the samples were found positive for NS1 antigen 125 (85%), which indicate high sensitivity of the test for early diagnosis of disease, followed by IgM, & IgG antibody, however similar study conducted by Anand et al.<sup>13</sup> Fever was present in all cases and is the most common symptom followed by headache (62%) and Myalgia (52%), Joint pain (31.5%), Dry cough (29%), and Nausea (22%), Diarrhea (13%), which is concordant with the study by Mandal et al.<sup>14</sup> Abdominal pain (20%), & vomiting (32%), was found to be present among 50% of the study population, which could be due to the liver injury caused by the Dengue virus.<sup>15</sup> Retro-orbital pain was seen in few (10%) of our patients, while Denys et al,<sup>15</sup> and was reported 16.1%. Burning Micturition (8.2%), Hemoptysis (2.7%), and Rashes (0.2%) were not as seen frequent in our study compared to other studies.

In our study, Thrombocytopenia was present with 36 (24%) patients less than 150000/cmm, which coincides with study conducted by Nishat Hussain et al.<sup>16</sup> Thrombocytopenia is one of the important causes of developing petechial rashes. Leucopenia, and Raised Hematocrit patients were 16 (11%), and 11 (7.2%), which shows low incidence comparing to the previous studies. No deaths were seen in our study which indicates prompt diagnosis and early management, creating significant changes in prognosis.

**Table 3:** Serological marker wise distribution of Dengue cases.

Total No. of Patients (n = 146) Dengue Positive cases	Dengue specific marker				
	NS1 Ag 125(85%)	IgM 4 (2.7%)	IgG 15(10%)	NS1 Ag + IgM 1(0.6%)	NS1 Ag + IgG 1(0.6%)

**Table 4:** Clinical features of Dengue positive cases (N=146)

Clinical Features	Total No. of Patients (n = 146)	Percentage (%)
Fever	146	100
Headache	96	65
Myalgia	76	52
Body pain	48	33.2
Vomiting	47	32
Joint pain	46	31.5
Dry cough	42	29
Nausea	32	22
Abdominal Pain	29	20
Diahorrea	19	13
Retro-orbital pain	15	10
Burning micturition	12	8.2
Haemoptysis	04	2.7
Rashes	03	02
Associated Diseases	02	1.3

**Table 5:** Hematological parameters of Dengue Positive Cases (N=146)

Investigation	No. of cases (%)
Thrombocytopenia (<1,50,000/cumm)	36 (24%)
Leucopenia (<4,000/cumm)	16 (11%)
Raised Haematocrit	11 (7.6%)

## 5. Conclusions

To conclude, this study has revealed that clinical manifestation is varied considerably from fever, myalgia to life threatening situations like dengue hemorrhagic fever or dengue shock syndrome if not treated on time. Therefore, early recognition and prompt management is required to decrease the morbidity and mortality of illness.

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## 7. Conflicts of Interest

All contributing authors declare no conflicts of interest.

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None.

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