

## Original Research Article

# The 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 acute viral illness associated with considerable morbidity and mortality. Recently, there is an alarming rise of dengue in India. This study was undertaken to know the clinical profile and laboratory findings during the evolution of dengue fever.

**Methods:** A total of 120 patients of dengue fever who were NS1 antigen or IgM dengue positive, admitted to medical wards of Narayana Medical College, Nellore included in the study. Thorough clinical examination and relevant laboratory investigations performed in all patients

**Results:** Males were commonly affected (72.4%). Fever was the most common presentation (100%), followed by headache (96%) myalgia (94%), abdominal pain (24.46%), and retro-orbital pain (12.45%). Malena was the most common hemorrhagic manifestation. Laboratory findings include varying degree of thrombocytopenia in all patients, leukocytopenia (30.52%), increased hematocrit (>45%) (67.59%) and deranged liver function test (58.33%)

**Conclusions:** Early diagnosis, monitoring, and prompt supportive management can reduce mortality in dengue. Atypical presentations of dengue should be kept in mind, which may cause a delay in the diagnosis. Increased community awareness and vector control measures need to be strengthened during the peri-monsoon period to reduce the burden of dengue cases.

**Keywords:** Clinical, Dengue fever, Laboratory profile

### INTRODUCTION

Dengue is a mosquito-borne viral disease that has rapidly spread in all regions of WHO in recent years.<sup>1</sup> Dengue virus is transmitted by female mosquitoes mainly of the species *Aedes aegypti*.<sup>1</sup> After the incubation period of 4-10 days, an infected mosquito is capable of transmitting the virus for the rest of its life. The infection causes a flu-like illness and occasionally develops into a potentially lethal complication called severe dengue.<sup>2</sup>

The global incidence of dengue has grown dramatically in recent decades.<sup>1</sup> About 3.9 billion people, in 128

countries, are at risk of infection with dengue viruses.<sup>3</sup> Dengue is found in tropical and sub-tropical climates worldwide, mostly in urban and semi-urban areas.<sup>2</sup> Severe dengue is a leading cause of severe illness and death among children in some Asian and Latin American countries.<sup>2</sup>

The exact clinical and laboratory profile is crucial for diagnosis as well as the 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 our hospital.

**METHODS**

The present study was done in the department of medicine, Narayana medical college from august 2017 to January 2018. Authors included a total of 120 patients of dengue fever who were NS1 antigen or IgM dengue positive patients admitted to medical wards.

Authors have taken a detailed history and done a careful clinical examination of each patient. Laboratory investigations done were hemoglobin, total, and differential leukocyte counts, platelet count, hematocrit, liver function tests, blood urea, serum creatinine, chest radiograph, and an ultrasound scan of the abdomen. Authors monitored blood counts and hematocrit periodically as and when required till resolution.

DHF is defined as an acute febrile illness with minor or major bleeding, thrombocytopenia (platelet count 1,00,000) and evidenced by plasma leakage documented by hemoconcentration (hematocrit increased by at least one-fifth or decreased by the same amount after intravenous fluid therapy).<sup>4,5</sup>

DSS is defined as DHF with signs of circulatory failure, including narrow pulse pressure (20 mm Hg) hypotension, or frank shock.<sup>4,5</sup>

**Inclusion criteria**

All patients above 14 years with confirmed dengue, who were either NS1 (nonstructural protein) antigen and/ or IgM dengue antibody positivity were included in the study.

**Exclusion criteria**

- Patients of less than 18 years of age
- Patients with concomitant malaria, typhoid, leptospirosis
- Tested negative for dengue IgM antibody and/or NS1 antigen by ELISA.

**RESULTS**

A total of 120 patients presented between August 2017 to January 2018 were included in this study.

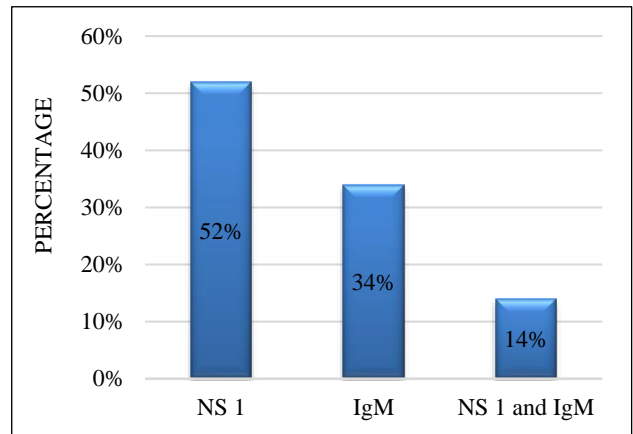
**Table 1: Age and sex distribution of dengue.**

Age (years)	Male	Female	Total	Percentage
14-18	10	4	14	11.6
19-35	42	15	57	48.2
36-55	26	11	37	30.6
56-65	7	3	10	8.4
>65	1	1	2	1.2
Total	86(72%)	34(26%)	120	100

Out of 120 patients, 98 (81.6%) patients had dengue fever, 19 (15.8%) patients had dengue hemorrhagic fever, and 3 (2.5%) patients had dengue shock syndrome (Table 2).

**Table 2: Showing the age-wise distribution and total cases of dengue fever, dengue hemorrhagic fever, and dengue shock syndrome.**

Age (years)	Dengue fever	Dengue hemorrhagic fever	Dengue shock syndrome	Total
14-18	11	2	1	14 (11.6%)
19-35	48	8	1	57 (48.2%)
36-55	37	5	1	37 (30.6%)
56-65	7	3	0	10 (8.4%)
>65	1	1	0	2 (1.2%)
Total	98 (81.6%)	19 (15.8%)	3(2.5%)	100



**Figure 1: Serological profile of dengue fever.**

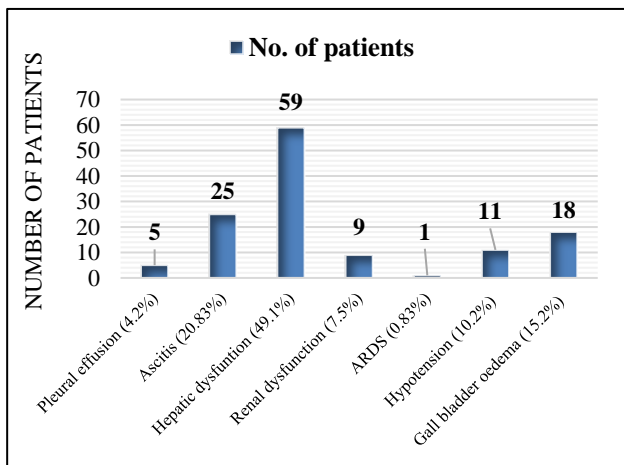
The serological profile shows that 62 (52%) patients were positive for NS1 antigen, 40 (34%) patients were positive for IgM antibody and 16 (14%) patients were positive for both NS1 antigen and IgM antibody (Figure 1).

Fever was the most common clinical presentation, present in all the patients. Headache (96%) and myalgias (94%) were the next common clinical presentation. Nausea and vomiting were present in 65 (54.2%) patients. About 19 (16%) patients had malena it was the most common bleeding manifestation. 14 (11.6%) patients had petechiae. Other bleeding signs include epistaxis (3.3%), bleeding gums (4.2%), and vaginal bleeding (2.5%) (Table 3).

About 59 (49.1%) patients had hepatic dysfunction, and it was the most common complication, followed by ascites, which was seen in 25 (20.83%) patients. Gall bladder edema was present in 18 (15.2%) patients. Other complications include pleural effusion (4.2%), renal dysfunction, hypotension, and ARDS (Figure 2).

**Table 3: Distribution of clinical features of dengue fever cases.**

Clinical features	Number of patients
Fever	120(100%)
Headache	115(96%)
Myalgia	112(94%)
Retroorbital pain	15(12.4%)
Abdominal pain	29(24.4%)
Nausea /vomiting	65(54.2%)
Diarrhea	4(4.8%)
Itching	12(10%)
Petechiae	14(11.6%)
Epistaxis	4(3.3%)
Bleeding gums	5(4.2%)
Bleeding pervagina	3(2.5%)
Malena	19(16%)
Altered sensorium	3(2.5%)



**Figure 2: Complications of dengue fever.**

About 9 (7.5%) patients presented with renal dysfunction, which got improved after the subsidence of illness. 11 (10.2%) patients presented with hypotension out of which three patients (2.5%) had dengue shock syndrome.

All the patients had thrombocytopenia but platelet Count less than 100000 were reported in 107 (89.46%) cases. Platelet count deteriorated initially but began to rise in the later course of illness. Authors gave Platelet transfusions if the platelet count was less than 10000 without bleeding manifestations or platelet count less than 20000 with bleeding manifestations. 36 (30.2%) patients had leukopenia. 81 (67.59%) patients had raised hematocrit. It was used as a guide for fluid management. Deranged liver enzymes like SGOT, SGPT were observed in 60.6% and 58.4% of patients respectively and is the usual presentation in dengue infection (Table 4).

All patients were managed symptomatically with regular monitoring of vitals, platelet count and hematocrit values and careful watch for bleeding manifestations. Platelet

transfusions and FFP transfusions administered when indicated.

**Table 4: Laboratory parameters.**

Lab parameters	No. of patients
Hb (<10gm/l)	11(9.1%)
HCT(>40%)	81 (67.59%)
TLC (<4000/cc)	36 (30.2%)
TLC (>13,000/cc)	8 (8.1%)
Platelets (<1 lakh)	107 (89.46%)
S. Na+ (<135meq/L)	7 (6.2%)
S. K+ (<3.5meq/L)	14 (12.7%)
S.Bil (T) >1.5mg	2 (1.9%)
SGOT(>40IU/L)	72 (60.6%)
SGPT(>40IU/L)	70 (58.4%)
ALP(>40IU/L)	67 (56.6%)
S.Urea(>50mg/dl)	6 (5%)
S. Cr (>1.3mg/dl)	4 (3.3%)

About three patients had dengue shock syndrome presenting with altered sensorium, and all the three patients died, in spite of adequate management. Out of these three patients, one had ARDS when presented to the emergency department. One patient presented with hypokalemic paralysis who recovered promptly within two days.

**DISCUSSION**

Unprecedented global population growth with unplanned and uncontrolled urbanization, in tropical developing nations, lead to an increase in the number of dengue cases over the past few years. The substandard housing, crowding, and deterioration in water, sewer, and waste management systems gave ideal conditions for mosquito-borne diseases in tropical urban areas.<sup>6</sup>

In our study, the male to female ratio was 2.59:1. The higher number may be because of primarily outside works done by them. A survey conducted reveals a similar figure of 2.4: 1, whereas in a study done by the ratio is 1.3:1. The majority of the cases 56 (48.2%) were in the age group of 19-35 years, which was similar to other studies showing a maximum number of patients occurred in the age group 15-44 years.<sup>7,8</sup>

Fever was the most common presenting symptom in 120 (100%) patients, which is similar to studies from India and Southeast Asia. Majority of cases had Headache (96%), and myalgia (94%) and the presentation is identical to the survey done. Retro-orbital pain was observed in 12.4% of patients, whereas it was seen in 50% of patients study.<sup>9</sup>

About 15.8% cases had DHF which is higher when compared to studies from Udupi (8.8 %), and Delhi (10.3%). The most common bleeding manifestation was

malena (16%) which was similar to the 2006 outbreak of dengue in North India.<sup>10-12</sup>

One patient of age 32 years presented with hypokalemic quadriparesis, who recovered promptly within two days. He had no similar history in the past or family history of hypokalemic paralysis. study had three patients (2.97%) with symptomatic hypokalemia and bilateral weakness of lower limbs with absent deep tendon reflexes. A review of the published literature done by showed that there were 35 instances of hypokalemic paralysis associated with dengue from the Indian subcontinent.<sup>13,14</sup>

Haemoglobin <10gm/L was seen in 9.1% cases. This presentation is more in a study conducted.<sup>15</sup> Hematocrit was increased in 67.59% cases while it was increased only in 30 % of patients in the study.<sup>9</sup> Leukopenia (30.2%) was more common than leucocytosis (7.40%), whereas study and a study done in Maharashtra had leucopenia in 30% and 43.8% cases respectively.<sup>16,17</sup> Thrombocytopenia was found in all cases, but platelet count less than 100000 were reported in 89.4% cases, have reported 72.7% cases with thrombocytopenia.<sup>18</sup> Elevation of liver enzymes is a common finding in dengue infection, and the current study also showed the same.

The overall mortality was 2.7%, which was comparable to previous studies conducted in India. Observed a case fatality rate of 3.8%. study had a mortality rate of 4%.<sup>19,20</sup>

## CONCLUSION

Dengue fever is a significant public health concern worldwide. Fever, headache, myalgia, and gastrointestinal symptoms are common presentations. Thrombocytopenia, leucopenia, raised hematocrit, deranged LFT were the common laboratory findings. Mortality was found to be high in patients presenting with dengue shock syndrome. Increased community awareness and vector control measures need to be strengthened during the peri-monsoon period to reduce the burden of dengue cases.

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## REFERENCES

1. World health organization. Fact sheet: Dengue and severe dengue, available at <https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue>.
2. World health organization South-East Asian regional office. Neglected tropical diseases, Dengue, dengue fact sheet. Available at [http://www.searo.who.int/entity/vector\\_borne\\_tropical\\_diseases/data/data\\_factsheet/en/](http://www.searo.who.int/entity/vector_borne_tropical_diseases/data/data_factsheet/en/).
3. Brady OJ, Gething PW, Bhatt S, Messina JP, Brownstein JS, Hoen AG, et al. Refining the Global Spatial Limits of Dengue Virus Transmission by Evidence-Based Consensus. *PLoS Negl Trop Dis.* 2012;6(8): e1760.
4. National Vector Borne Disease Control Programme (NVBDCP), Ministry of Health & Family Welfare, Government of India. National guidelines for clinical management of dengue fever. Available at <https://nvbdc.gov.in/WriteReadData/1892s/Dengue-National-Guidelines-2014.pdf>.
5. World health organization South-East Asian regional office. Comprehensive guidelines for prevention and control of dengue and dengue hemorrhagic fever. Revised and expanded edition. (SEARO Technical Publication Series No. 60). Available at: [http://www.searo.who.int/entity/vector\\_borne\\_tropical\\_diseases/documents/SEAROTPS60/en/](http://www.searo.who.int/entity/vector_borne_tropical_diseases/documents/SEAROTPS60/en/).
6. Gubler DJ. *Clin Microbiol Reviews.* Jul 1998;11(3):480-96.
7. Deshwal R, Qureshi MI, Singh R. Clinical and Laboratory Profile of Dengue Fever. *J Assoc Physicians India.* 2015;63(12):30-2.
8. Saini S, Anagha GK, Sachin D, Deepika B, Roushni SB. Epidemiology and Seropositivity of dengue cases in a tertiary care hospital of western Maharashtra, India. *IJBAR* 2013;4(7):473-77.
9. Mavilla A, Rahul HD. Screening and manifestations of seropositive dengue fever patients in perambalur: A hospital-based study. *Intern J Medical Science and Public Health.* 2014;3(6):745-8.
10. Kumar A, Rao CR, Pandit V, Shetty S, Bammigatti C, Samarasinghe CM. Clinical manifestations and trend of dengue cases admitted in a tertiary care hospital, Udupi district, Karnataka. *Indian J Community Med.* 2010;35(3):386-90.
11. Ahmed NH, Broor S. Dengue Fever Outbreak in Delhi, North India: A Clinico-Epidemiological Study. *Indian Journal of Community Medicine: Official Publication of Indian Association of Preventive & Social Medicine.* 2015;40(2):135-8.
12. Chandralekha, Gupta P, Trikha A. The north Indian dengue outbreak 2006: a retrospective analysis of intensive care units admissions in a tertiary care hospital. *Trans R Soc Trop Med Hyg.* 2008;102(2):143-7.
13. Jain D, Rajput R, Pathak V, Mittal A, Jain P. *Changing Trends in Clinical Presentation and*

- Biochemical Spectrum of Dengue Fever: An Observation of a Tertiary Care Centre, Arch Clin Infect Dis. 2017;12(3):e62221.
14. Malhotra HS, Garg RK. Dengue-associated hypokalemic paralysis: Causal or incidental?. J Neurologi Scienc. 2014 May 15;340(1-2):19-25.
  15. Tejushree A, Thejaswini HS, Madhuri K. A serological study of Dengue and Hanta virus in acute febrile patients in a tertiary care hospital. Interna J Pharmaceutical Science. Invention 2014;3(7):22-5.
  16. Khan SA, Dutta P, Topno R, Soni M, Mahanta J. Dengue Outbreak in a Hilly State of Arunachal Pradesh in Northeast India. The Scientific World J. 2014;2014.
  17. Kale AV, Haseeb M, Reddy S, Khan S, Golwalkar ABK. Clinical Profile and Outcome of Dengue Fever from a Tertiary Care Centre at Aurangabad Maharashtra India: An Observational Study. IOSR J Dental Med Sci. 2014;13(9):14-9.
  18. Rashmi KS, Jagdeesh, Ravikumar KL, Giridhar UP, Arun KR. Serological markers prevalence and trend of probable dengue infection at a tertiary care hospital in Bangalore. J Evolution of Medical and Dental Sciences. 2013;2(36):6968-77.
  19. Chatterjee N, Mukhopadhyay M, Ghosh S, Mondol M, Das C, Patar K. An observational study of dengue fever in a tertiary care hospital of Eastern India. J Associ Physicians of India. 2014;62(3):224-7.
  20. Chhotala YH, Suva CM. A study of clinical profile of dengue fever in a tertiary care hospital of Jamnagar, Gujarat, India. Int J Res Med Sci. 2016;4(10):4500-4.

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