# Clinical and Laboratory Profile of Dengue Fever in Children in a Tertiary Care Centre in Mahabub Nagar, Telangana

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## ABSTRACT

### BACKGROUND
Dengue fever an arbovirus mediated infection, is emerging as one of the most important arthropod borne viral diseases in terms of morbidity and mortality. The objective of this study is to assess the clinical and laboratory pattern of dengue fever in children admitted in Govt. General Hospital, Mahabub Nagar, Telangana.

### METHODS
This observational hospital-based study was conducted in Govt. General Hospital, Mahabub Nagar from Sept 2019 to Dec 2019. Children between the age group of 6 months to 12 years, who were NS1 antigen/ anti dengue IgM antibody positive during this period were included in our study. Clinical features, laboratory parameters and radiological features were studied and analysed.

### RESULTS
Among 100 cases studied, majority were males (57%); major age group was 6 years to 10 years (58%). Fever was present in all patients. Among other symptoms, vomiting was the major symptom (40%) followed by myalgia (17%). Significant changes in platelet count [<1 lac (41%)] and radiological changes [gallbladder wall oedema (19%)] were observed. No deaths were recorded in our study.

### CONCLUSIONS
Early diagnosis and supportive treatment are the corner stone for good recovery in dengue fever. Strong clinical suspicion, early diagnosis with rapid tests and careful management reduces morbidity and mortality.

### KEYWORDS
Dengue Fever, Warning Signs, Myalgia, Platelet Counts

## BACKGROUND

The emergence and spread of all four dengue viruses ("serotypes") from Asia to the Americas, Africa and the Eastern Mediterranean regions represent a global pandemic threat. During the past five decades, the incidence of dengue has increased 30-fold.[1] Dengue mortality can be reduced by implementing early case detection and referral systems for patients; managing severe cases with appropriate treatment; reorienting health services to cope with dengue outbreaks; and training health personnel at all levels of the health system.[1] Younger age group involvement and increase in number of epidemics denotes higher incidence of infection. It is estimated that during outbreaks, about 150-200 mild to silent infections occur in the community for each case of DSS seen in the hospital.[2] Some patients with dengue infection have varying degrees of mucosal and cutaneous bleeds with thrombocytopenia. These patients may not show other criteria for diagnosis of DHF/DSS, i.e. haemoconcentration or objective evidence of fluid leak (ascites, pleural effusion). These patients are classified as dengue fever with unusual bleeding. Patients falling under this category may be seen in significant numbers in epidemics.[2]

DHF can occur in all age groups including infants. Risk factors for DHF/DSS are (1) virus strain: risk is greatest for DENV-2 followed by DENV-3, DENV-4 and DENV-1. (2) Pre-existing anti-dengue antibody; (3) age of host: younger children are at increased risk; (4) secondary infection and (5) hyperendemicity- two or more serotypes may be circulating simultaneously at high level.[2] Dengue viruses are transmitted by mosquitoes of the Stegomyia family. Aedes aegypti, a day time biting mosquito, is the principal vector. In most tropical areas, A. aegypti is highly urbanized, breeding in water stored for drinking or bathing and in rain water collected in any container. Dengue viruses have also been recovered from Aedes albopictus as in 2001 Hawaiian epidemic.[3] DF virus belongs to Flaviviridae family, all four serotypes of dengue virus cause dengue fever. Dengue fever, a benign syndrome characterized by biphasic fever, myalgia or arthralgia, rash, leukopenia, and lymphadenopathy.[3]

Dengue outbreaks in urban areas infested with A. aegypti may be explosive; up to 70-80% of the population may be involved. Most disease occurs in older children and adults. Because A. aegypti has a limited flight range, spread of an epidemic occurs mainly through viraemic human beings and follows the main lines of transportation.[3] People infected with one serotype maintain a life-long protective immunity to infection by the homologous virus. However protective immunity to infection with heterologous serotypes is transitory. During a secondary infection with a different serotype, the presence of low amount of heterotypic neutralizing antibodies could prevent severe disease.[4] Infants may develop dengue haemorrhagic fever. As compared to older children they develop more nervous system manifestations in form of seizures, encephalopathy, bleeding and hepatic dysfunction. They have less shock.[5]

although DF is very common in south India, studies on DF from remote places are lacking. With this background, the present study is undertaken, to assess the clinical and laboratory profile of serologically confirmed cases of dengue fever in our hospital.

## METHODS

This is a descriptive, observational, record-based study. Hospital records of all DF patients, who were hospitalized in paediatric department of Govt. General Hospital, Mahabub Nagar from September 2019 to December 2019 were reviewed.

### Inclusion Criteria
Febrile children 6 months to 12 years with NS1 antigen positive or anti-dengue immunoglobulin M (IgM) positive.

### Exclusion Criteria
- Febrile children below 6 months age and above 12 years.
- Children with other infections like typhoid, malaria, UTI, respiratory illness etc are excluded.

We analysed the case records of children diagnosed to have DF both clinical and laboratory confirmed - either by non-structural protein 1 (NS1) antigen positive or anti-dengue immunoglobulin M (IgM) antibody positive during this study period. Complete blood count, dengue NS1 antigen and IgM dengue antibody, chest radiograph and ultrasound abdomen reports were recorded and analysed in DF patients. Regular monitoring of platelet counts was done. Platelet count less than 1.5 lacs is taken as thrombocytopenia and divided into mild, moderate and severe thrombocytopenia. Platelet count 51,000-1.5 lacs is taken as mild thrombocytopenia, 21,000-50,000 is taken as moderate thrombocytopenia and less than 20,000 is taken as severe thrombocytopenia. WBC count less than 4000 is taken as leukopenia. Blood pressure monitored regularly.

### Data Analysis
Data is compiled and tabulated by using standard appropriate statistical technique, which includes numbers and percentages.

## RESULTS

In our study maximum number of patients 58(58%) with dengue fever (DF) belonged to 6-10 yr. age group, majority of patients were males 57 (57.0%) (Table 1).

| Age (Years) | Male | Female | Total |
|---|---|---|---|
| 6 mths-1 yr. | 00 | 03 | 03 |
| 1-5 | 13 | 07 | 20 |
| 6-10 | 29 | 29 | 58 |
| >10 | 15 | 04 | 19 |
| Total | 57 | 43 | 100 |
| *Table 1. Age and Sex Distribution of Dengue Patients* | | | |

| Clinical Features | No. of Patients |
|---|---|
| Fever | 100 |
| Vomiting | 40 |
| Myalgia | 17 |
| Cold & cough | 12 |
| Abdominal pain | 08 |
| Palms and soles erythema (Flushing) | 14 |
| Headache | 15 |
| Generalised Rash | 03 |
| Melena | 10 |
| Hypotension | 45 |
| **Table 2. Clinical Profile of Dengue Fever Patients** | |

Fever was present in all patients. Among other symptoms vomiting was the major symptom (40%) followed by myalgia (17%) (Table 2). Children with dengue rash were least 3% only. Hypotension was present in 45% of dengue children who were managed according to WHO protocol.

| Cell Counts | No. of Patients |
|---|---|
| WBC <4000/cumm | 25 |
| Platelet count | |
| <20,000 | 03 |
| 20,000-50,000 | 06 |
| 50,000-1 lac | 32 |
| 1 lack -1.5 lac | 27 |
| >1.5 lac | 32 |
| **Table 3. Laboratory Parameters of Dengue Fever Patients** | |

Significant changes in white blood cell counts and platelet counts were observed (Table 3). Severe thrombocytopenia was observed in 3% of patients and moderate thrombocytopenia in 6% of patients. 32% of patients had normal platelet count. Leukopenia was seen in 25% of patients. Ultrasound abdomen was performed in all dengue seropositive patients. (Table 4)

| | |
|---|---|
| Gallbladder wall oedema | 19 |
| Pleural effusion | 06 |
| Ascites | 11 |
| **Table 4. Radiological Features Observed** | |

Gallbladder wall oedema was seen in 19% of patients, pleural effusion in 06% of patients and ascites in 11% of patients. All patients were treated symptomatically with crystalloids, ORS and paracetamol. NSAIDS were avoided. Hypotension cases were treated with ORS and crystalloids. Three children with platelet count <20000 severe thrombocytopenia with melena were given platelet transfusion. Regular monitoring of vitals was done in all patients. All Dengue children were treated with ORS and Ringer lactate and discharged. No deaths were recorded during our study.

## DISCUSSION

DF is emerging as an important disease. Classic DF is marked by rapid onset of high fever, headache, retro-orbital pain, vomiting, myalgia, abdominal pain, petechiae, melena and maculopapular rash.[6,7,8] In our study maximum number of patients, 58%, belonged to the age group between 6 years to10 years in contrast to Peter P Vazhayil et al study where maximum number of patients were in age above 11 years (46%).[6] K Jayasree et al study shows 6-10 yrs. as most common affected age group similar to our study.[9] In present study majority of patients were males (57%). Similar results

were observed in P P Vazhayil et al, K Jayasree et al and Shubhankar Mishra et al and Anand et alstudies.[6,9,10,11]

In this study fever was present in all 100 (100%) patients; followed by vomiting in 40(40%) and myalgia in 17 (17%) patients. Similar findings were observed in Méndez A, González G study and Antony J, Celine TM study.[12,13] One of the main laboratory parameters in DF is thrombocytopenia. In present study platelet count less than 50 thousand were observed in 41 patients. Severe thrombocytopenia (platelet count <20000) was seen in 3% in contrast to study done by to Peter P Vazhayil, study where severe thrombocytopenia was seen in 8.97% cases and K Jayasree et al study where (9.45%) had platelet counts <20,000 (severe thrombocytopenia).[6,9] USG abdomen was done in all children. Major radiological abnormality seen was gallbladder wall oedema (19%) followed by ascites (11%) in contrast to study by Shubhankar Mishra et al study where hepatomegaly (52.75%) and ascites (25.77%) were most common features.[10] In study by Rajesh Deshwal et al pleural effusion (20.0%) and ascites (16.31%) were most common radiological abnormalities, in contrast to 6% pleural effusion in our study.[14] Radiological evaluation will also help in assessing the severity of the illness and thus initiating appropriate therapy.

## CONCLUSIONS

Majority of patients needed only ORS and crystalloids in our study. Only 3 children with platelet count less than 20,000 with melena required platelet transfusion. Thrombocytopenia in rest of the patients recovered spontaneously. DF is a common acute febrile illness which comes as an epidemic in various parts of the country including Telangana. Over the recent years, it has emerged as one of the dreaded fevers in children. Development of a dengue vaccine is considered as a high public health priority. A safe and efficacious dengue vaccine would also be important for travellers.[11] Knowledge and understanding of the varied presentations of DF in a region will definitely help in improving the outcome of this potentially fatal disease.

**Author Contributions**
Myself Dr. Jagadeesh Kumar Manthena and Dr Jyothi, we collected the data and prepared the manuscript. Dr Nagaveni and Dr K.V. Subbarao helped us in the conception and design of the study, in data analysis and interpretation. Thanks to Dr. Snehalatha for guiding us in concluding this study.

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