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IP International Journal of Medical Paediatrics and Oncology

Journal homepage: <https://www.ipinnovative.com/journals/IJMPO>

## Original Research Article

## A clinico pathological profile of dengue fever in children in urban areas of Telangana

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## ARTICLE INFO

## Article history:

Received 27-07-2020

Accepted 31-10-2020

Available online 09-01-2021

## Keywords:

Dengue virus infection

Fever

Thrombocytopenia

## ABSTRACT

**Background:** Dengue is a common disease in this part of the world. It is one of the dreaded fevers for the paediatric age group. The disease has various presentations and features, but early diagnosis and management can decrease mortality rate significantly.

**Aims:** To evaluate the clinical profile of dengue infection in children under the age of 14 in urban areas of Telangana. The study is done in the tertiary care centre in urban area.

**Materials and Methods:** It is Hospital based descriptive, retrospective observational study. All probable cases of dengue were admitted with provisional diagnosis of dengue fever to the department of paediatrics for a period of one year. Total 198 children of age less than 14 years participated in present study.

**Results:** Out of 198 samples of clinically suspected dengue cases, 192 were found positive for Dengue NS1 antigen, 145 were found to be positive by IgG and 139 cases were positive for IgM. Majority of cases are males (62%) females were 38%. Most commonly affected age group is 6- 10 years of age 95 cases (47.9%) Most of the patients in study are hospitalized for a period of 3-6 days (51.5%). Fever (99.5%) was the most common symptom found in all the patients followed by vomiting (17.7%). Hypotension was found in 9% of the patients.

Severe thrombocytopenia was observed in 3.5% of patients and moderate thrombocytopenia in 7% of patients. 46.5% of patients had normal platelet count. Leukopenia was seen in 29.8% of patients.

**Conclusions:** Fever was the most common symptom found in all the patients. Majority of cases showed thrombocytopenia.

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## 1. Introduction

Dengue virus infection (DVI) is a mosquito-born disease and is a public health issue that is rising. The virus has been unwittingly transported from infectious areas to other parts of the world due to the upsurge of trade and tourist activity.<sup>1</sup> The dramatic rise in dengue cases in Eastern India in 2012 became a public health issue as the majority of cases involved young teenagers. Infection with the Dengue virus causes substantial morbidity and mortality. India is one of the seven reported countries that routinely record dengue fever (DF) outbreaks in the South-East region,

and all four serotypes are known to circulate either alone or in combination.<sup>2</sup> In terms of presentation, the clinical presentations range from moderate constitutional signs to extreme dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS) infections. While most infections are self-limiting, a small subset of patients experience serious complications that require intensive care. These complications arise very late in the illness, like organ loss, possibly offering a window of opportunity to identify a subset of patients who are likely to proceed through these complications.

It is difficult to manage dengue infections because it needs not only good control of the vectors responsible for viral spread, but also precise and rapid detection. To

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date, the precise and timely diagnosis of early detection of Dengue virus remains an issue in the management of patients with dengue infection in many parts of the world, especially in resource-limited countries. Warning signals "which may mean that patients may progress to a serious illness and need strict medical attention." Major plasma leakage, hemorrhagic complications, and/or serious organ dysfunction can manifest as severe dengue. The assumption that patient age affects the form and severity of symptoms is a concession on the sensitivity of the WHO classification system. Early case detection and treatment plays a key role in preventing both the seriousness and fatality of cases of dengue. The purpose of this research was to evaluate the clinical profile of dengue infection in children under the age of 14 in urban areas of Telangana.

## 2. Materials and Methods

It is Hospital based descriptive, prospective observational study. All probable cases with positive dengue tests were admitted with provisional diagnosis of dengue fever to the Paediatric Ward of Apollo Institute of Medical sciences from period June 2018 to May 2019 i.e. for a period of one year.

### 2.1. Inclusion criteria

All children aged up to 14 years with positive dengue tests, either NS1 antigen, IgM, IgG antibody rapid serological test kit or ELISA.

### 2.2. Exclusion criteria

Children who were positive for malaria, meningitis, and enteric fever.

The patients were exposed to all three serological examinations as the length of the history of fever may be fallacious. 198 were the total number of patients involved in our study. For the clinical and laboratory criteria, cases were followed up regularly. Blood parameters were tracked every day before remarkable clinical and haematological changes were seen. For each patient, averages of TLC, total platelet counts, Hb, haematocrit, and so on were measured and reported. With the tourniquet test, daily vitals were registered. Chest X-rays, ultrasonography, and liver function tests were conducted on all patients on day 3 of entry. As per the new WHO dengue guidelines,<sup>3</sup> patients were treated with oral paracetamol, intravenous fluids and blood products, inotropes whenever necessary. The occurrence of different signs and symptoms was compared with the non severe and serious disease and the laboratory experiments. The observations have been tabulated and correlated.

The clinical manifestations and laboratory findings like haemoglobin estimation, total platelet count, haematocrit estimation, NS1 antigen, and IgM antibody of each group of illness were compared using Fisher's exact test for

proportions. GraphPad version 6.0. software and SPSS version 22.0.0.0 software were used for data entry and analysis. value below 0.05 was considered significant.

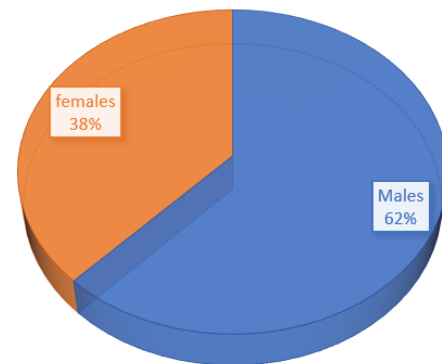
## 3. Results

Total 198 children of age less than 14 years participated in present study.

**Table 1:** Results of samples tested by antigen NS1, IgG and IgM (n= 198).

Results of the test	NS1	Ig G	Ig M
Positive	192(97%)	145(73%)	139(70%)
Negative	6(3%)	53(27%)	59(30%)

Out of 198 samples of clinically suspected dengue cases, 192 were found positive for Dengue NS1 antigen, 145 were found to be positive by IgG and IgM was positive for 139 cases.



Majority of cases are males 62% and 38 %were females

**Fig. 1:** Gender distribution in study

**Table 2:** Age distribution in study

Age intervals	Number of patients	Percentages
<1 year	12	6.1
1-5 years	36	18.2
6-10 years	95	47.9
11-14 years	55	27.8
Total	198	100
<b>Duration of Hospitalization</b>		
<3 days	20	10
3-6	102	51.5
>6	76	38.5

Most commonly affected age group is 6- 10 years of age 95 cases (47.9%) followed by 11-14 years 55 cases (27.8%), 1-5 years 36 cases (18.2%) and < 1 year 12 cases (6.1%).

Most of the patients in study are hospitalized for a period of 3-6 days (51.5%).

**Table 3:** Clinical signs and symptoms of dengue fever.

Clinical features	Number of patients	Percentages
Fever	197	99.5
Vomiting	35	17.7
Abdominal pain	7	3.5
Rash	6	3
Loose stools	5	2.5
Cold	5	2.5
Head ache	3	1.5
Body pains	4	2
Bleeding manifestation	2	1
Hypotension	18	9

Fever (99.5%) was the most common symptom found in all the patients followed by vomiting (17.7%).

**Table 4:** Laboratory Parameters of Dengue Fever Patients.

Parameters	Number of patients	Percentages
Total leucocyte count <4000/cumm	59	29.8
Platelet count <20,000	7	3.5
20,000-50,000	14	7
50,000-1 lakh	92	46.5
1 lakh-1.5 lakh	49	24.7
>1.5 lakh	36	18

Significant changes in white blood cell counts and platelet counts were observed. Severe thrombocytopenia was observed in 3.5% of patients and moderate thrombocytopenia in 7% of patients. 46.5% of patients had mild thrombocytopenia. Leukopenia was seen in 29.8% of patients.

#### 4. Discussion

Out of 198 samples of clinically suspected dengue cases, 192 were found positive for Dengue NS1 antigen, 145 were found to be positive by IgG and IgM was positive for 139 cases (Table 1). In study done by Chajhlana SPS et al. 137 samples of clinically suspected dengue cases, 119 (86.9%) found to be positive dengue cases by laboratory confirmed cases (positive by one or more of the following tests NS1, antigen, IgM, IgG antibody). Study conducted by Anand et al found 83.3% positive cases.<sup>4,5</sup>

Majority of cases are males 62% and 38% were females (Figure 1). Chajhlana SPS et al and Tabassum et al in their study found that there was more number of males. also P P Vazhayil et al, K Jayasree et al and Shubhankar Mishra et al and Anand et al studies.<sup>4,6-10</sup>

In the present study most commonly affected age group is 6- 10 years of age 95 cases (47.9%)(Table-2). K Jayasree

et al study shows 6-10 yrs. as most common affected age group similar to our study. Peter P Vazhayil et al study where maximum number of patients were in age above 11 years (46%) which is contrast to our study.<sup>7,8</sup>

Most of the patients in study are hospitalized for a period of 3-6 days (51.5%). In study done by Shubhankar Mishra et al. The mean duration of hospitalisation was 3.8 days with 63.9% of patients were admitted in the hospital for 3–6 days.<sup>9</sup>

In our study Fever (99.5%) was the most common symptom found in all the patients followed by vomiting (17.7%), (Table 3). In study done by Kumar SK et al.<sup>11</sup> fever was present in most of the cases, followed by vomiting and abdominal pain which is also similar to the study conducted Ahmed S et al. in Pakistan.<sup>12</sup> In the study conducted by Kashinkunti et al,<sup>13</sup> Fever was the most common symptom found in all the patients followed by headache (83.1%), Myalgia (77.3%), retro- orbital pain (74.7%). Hypotension was found in 86.5% of the patients. Kashinkunti et al, found the most common presentation was fever 100 (100%), followed by headache (90%), myalgia (81%), vomiting (56%) and abdominal pain (48%).<sup>13</sup>

In our study Severe thrombocytopenia was observed in 3.5% of patients and moderate thrombocytopenia in 7% of patients. 46.5% of patients had mild thrombocytopenia. 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.<sup>9,10</sup> Southeast Asian countries, report tourniquet test positivity as the commonest bleeding manifestation. Low proportion of positive tourniquet test in Indian studies may be due to the darker skin colour in Indian children.<sup>14</sup>

Leukopenia was seen in 29.8% of patients which was similar to two other studies.<sup>14,15</sup> The earliest haematological abnormality is a progressive decline in total WBC count in patients of dengue. Leukopenia was not significantly related with severe dengue cases which were against some results.<sup>16</sup>

The exact pathophysiology of thrombocytopenia in dengue is not yet clearly elucidated. Dengue virus may have a direct effect on the bone marrow -specially the progenitor cells causing a reduction in their capacity to replicate. An aberrant immunological response, implicated in severe dengue seems to play a significant role by dysregulation of plasma-kinin system. This leads to an increased consumption of platelets by disseminated intravascular coagulation (DIC). The damage is enhanced by increased apoptosis of platelets and generation of antiplatelet antibodies.

#### 5. Conclusion

High grade fever, vomiting with normal or low platelet count were the presenting features in children. Early diagnosis, monitoring and prompt supportive management

can reduce mortality.

Thrombocytopenia is one of the common findings . Dengue 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. Knowledge and understanding of the varied presentations of DF in a region will definitely help in improving the outcome of this potentially fatal disease.

## 6. Conflict of Interest

None.

## 7. Source of Funding

None.

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**Cite this article:** Surampud SK, Reddy KS, Mazher N, Sankuru D. A clinico pathological profile of dengue fever in children in urban areas of Telangana. *IP Int J Med Paediatr Oncol* 2020;6(4):143-146.