

## Original Research :

# Clinical and Diagnostic profile in patients with Dengue fever in a resource limited setting

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### Abstract:

The epidemiology of dengue fever is changing dramatically over the last few decades with respect to the prevalent strains, affected geographic population, and severity of the disease. It is no longer confined to an urban area with frequent outbreaks now occurring more in rural areas. There are certain salient clinical features, which help in the detection of dengue fever cases but they can also present with varied clinical manifestations.

**Aims and objectives:** 1. To study clinical symptoms and signs associated with dengue infection 2. To analyse blood investigations done in selected cases 3. To find association with immunological test and severity of dengue

**Inclusion Criteria:** 1. Age group 0-15 years 2. Clinical features suggestive of dengue illness and confirmed either by rapid dengue test and or dengue IgM, IgG antibody test by ELISA method

**Exclusion Criteria:** 1. Children with immunodeficiency namely severe malnutrition, HIV positive and malignancies 2. Children with coexistent infections like malaria, enteric fever and tuberculosis

**Methodology:** All children in the age group of 0-15 years who had clinical features suggestive of dengue illness and confirmed either by rapid dengue test and or dengue IgM, IgG antibody test by ELISA method were included in the study. Children were from urban and rural region in and around Chandrapur. Maximum cases were OPD and 28% were admissions. Parents or the guardians

of all the subjects provided verbal consent for the study. A detailed symptomatology, vitals, general, and systemic examination findings were recorded in a predesigned proforma at the time of admission and were monitored periodically

### Results:

The most common age group affected was more than 6 years which is in accordance with other studies. Children in the rural areas are more affected. High grade fever more than 103 of was less commonly seen. Rash was seen in age group of 1-3 years and age more than 6 years. Rash in upper limb alone and lower limb alone are significantly observed in age group of more than 3 years. Pain in abdomen is more seen in children more than 6 years but respiratory symptoms are commonly seen in age less than 6 years. Thrombocytopenia has no relation to severity of the disease as observed in the study. Systemic findings are more common between 1-3 years of age. Normal platelet count were more commonly found. Increased haematocrit was not a significant finding.

**Key Words :** Dengue, DHF, Ns1 Antigen.

### Introduction:

Dengue fever, also known as breakbone fever, causes a flu-like illness. There are four serotypes of dengue fever. Most patients survive and have immunity for life from the serotype of flavivirus they have caught. However, patients who are infected with a second serotype are more likely to develop dengue haemorrhagic fever (DHF), possibly because of immune enhancement. Dengue haemorrhagic fever is a more virulent, and

potentially has lethal complications. Dengue infects approximately 50 million people worldwide per year (WHO, 2008).

Globally, Dengue is considered to be the most important mosquito-borne disease, which is found to be endemic in more than 100 countries (1). In Southeast Asian countries, dengue constitutes a major cause of paediatric morbidity and mortality (2). The epidemiology of dengue fever is changing dramatically over the last few decades with respect to the prevalent strains, affected geographic population, and severity of the disease. It is no longer confined to an urban area with frequent outbreaks now occurring more in rural areas (3). There are certain salient clinical features, which help in the detection of dengue fever cases but they can also present with varied clinical manifestations (4).

The onset of dengue symptoms is marked by the presence of dengue NS1 antigen in the patient's serum. NS1 is a glycoprotein that is common to all dengue serotypes and can be used to detect either primary or secondary infections in the earliest stages. Serology testing for dengue virus-specific antibodies, types IgG and IgM, can be useful in confirming primary or secondary diagnosis. IgM is produced approximately 5 days after infection in both primary and secondary infections, while IgG is produced about 2 to 4 weeks after onset of primary infection and almost immediately after onset of a secondary infection.

This study is undertaken to study the clinical manifestations and Investigations of patients of Dengue fever admitted at a private hospital from children in and around Chandrapur to all the patients who are positive for dengue fever based on the positive serological testing.

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#### **Inclusion Criteria**

1. Age group 0-15 years
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#### **Exclusion Criteria**

1. Children with immunodeficiency namely severe malnutrition, HIV seropositivity and malignancies.
2. Coexistent infections like malaria , enteric fever and tuberculosis.

#### **Material and Methods**

This prospective observational study was conducted at Private Hospital, Chandrapur from February 2014 to February 2015. All children in the age group of 0-15 years who had clinical features suggestive of dengue illness and confirmed either by rapid dengue test and / or dengue IgM, IgG antibody test by ELISA method were included in the study. Children were from urban and rural region in and around Chandrapur. Maximum cases were OPD and 28% were admissions. Parents or the guardians of all the subjects provided verbal consent for the study. A detailed symptomatology, vitals, general, and systemic examination findings were recorded in a predesigned proforma at the time of admission and were monitored periodically. Presence of rash, pain in abdomen, bleeding manifestations, Headache, Cough, Altered Sensorium, Convulsions and other necessary details were noted. Haematological parameters such as total count, packed cell volume, platelet count was done in all patients. In the sick patients, liver function test, coagulation profile, blood sugar with electrolytes, ultrasound abdomen, and chest radiography were taken. The patients were

classified according to revised WHO criteria and managed appropriately. The clinical features, laboratory parameters and outcome of these children were taken for analysis.

**Results :**

A total of 630 children were diagnosed to have dengue fever in the study period; Age groups of 1-3yrs , 3-6yrs and 6-15yrs are divided. Majority of the children (40%) were from nearby rural areas of Chandrapur district, Maharashtra, India. The age group of less than 15 years were considered. 13% of the affected population were less than 3 years. Table 1 shows the age distribution of the children in the study along with their place of

living. Fever was noted in all most all dengue patients with mean duration of illness of 3 - 5 days. Table 2 is showing duration of fever with degree of fever in fahrenheit. The common presentation by these children includes Rash (53%), pain abdomen (5%), Cough (33%), Headache(45%), Vomiting(30%) and Itching (33%) each. Bleeding manifestations were observed in 23 (6%) of the cases of which epistaxis and malaena were the common bleeding manifestations noted. Hematuria , and bleeding per rectum was observed in 3and 2 cases respectively. Table 3 is showing frequency of the clinical symptoms according to the age group of the patient.

**Table 1: Age**

	1-3years	3-6years	6-15years
<b>Rural Population</b>	32	112	254
<b>Urban population</b>	46	84	102
	78	196	356

Observation In 1-3 year age group more cases are from the Urban children

**Table 2 : Fever**

Fever(days)	3-5 days	5-7days	>7days
<b>No of Children</b>	310	264	56

Based on Degree of Fahrenheit.

Fever(degree)	100-101 <sup>o</sup> F	102-103 <sup>o</sup> F	>103 <sup>o</sup> F
<b>No of Children</b>	302	298	30

**Table 3 : Symptoms evaluation**

<b>SYMPTOMS</b>	<b>1-3 years</b>	<b>3-6years</b>	<b>&gt;6years</b>	<b>Total</b>
Fever with Chills	NIL	26	70	96
Rash all over Body	36	11	49	96
Rash More in Upper limbs	4	72	126	202
Rash only in lower Extremities	NIL	12	26	38
Pain in Abdomen	NIL	6	26	32
Pain in Joints	NIL	4	7	11
Cough	68	109	33	210
Tightness in Chest / Difficulty in Respiration	NIL	3	14	17
Bleeding PR	NIL	NIL	2	2
Malena	NIL	3	18	21
Normal Bleeding	NIL	NIL	2	2
Headache	Could not assess	62	224	286
Altered Sensorium	1	5	6	12
Haematuria	1	1	1	3
Convulsion	22	5	1	28
Vomiting	33	49	118	200
Loose Motion	6	22	16	44
Itching	16	90	104	210

Table 3 elaborates the frequency of clinical symptoms according to the age group of the patients during the study period. Among the symptoms, after fever, Cough, Rash, Headache, Itching and vomiting are most common manifestations. Rashes were observed in 336 patients out of which rash was more commonly observed in the upper limbs.

**Table 4 : Signs in Dengue Study**

<b>SIGNS</b>	<b>1-3years</b>	<b>3-6years</b>	<b>&gt;6years</b>	<b>Total</b>
Temp<100f	18	6	82	106
100-103f	32	104	103	139
>103f	28	66	26	120
<b>Duration 3 days</b>	10	82	82	174
5days	22	70	103	195
7days	NIL	NIL	26	26
Low BP	Not recorded	Not recorded	42	42
Tachycardia	ALL	ALL	ALL	ALL
Hepatomegaly	39	18	42	99
Hepatosplenomegaly	29	16	32	77
Chest Signs	36	11	7	54
CVS cases	4	NIL	2	6
Skin Bleed	NIL	2	2	4
Rash(general)	47	22	62	129
Rash only in Extremities	Nil	22	108	130
Rash in Lower extremity	NIL	3	21	24
H/o Dehydration mild to moderate	NIL	4	8	12
Free fluid in abdomen	2	12	32	46
CNS Signs	(Irritable) 18 (AF full)4	(Irritable)4 (Inc DTR) 8	Decreased consciousness 2	36

Table 4 is showing the clinical signs in children in the study with the vitals of all the participants in the study. Tachycardia is present in all the children in the study. Abdominal findings of hepatomegaly and Hepatosplenomegaly were noted in 15.7% and 12.2% of the cases, respectively. Spleen was just palpable in almost all the cases. Rash was observed in 283(45%) children. Clinical fluid accumulation in the form of ascites were observed in (7%) of cases. Low BP was observed in 40 cases at admission. Chest signs such as bilateral crepts and ronchi were observed in 8% of children.

**Table 5 : LAB INVESTIGATION**

	1-3years	3-6years	>6years	Total
HB<6gm%	12	08	32	52
6-10gm%	21	92	196	309
>10gm%	45	NIL	198	243
Platelets<50,000	3	38	94	135
50-1,00,000	37	37	124	198
>1,00,000	38	121	138	297
HCT 25-30	42	106	196	344
30-35	28	81	142	251
>35	08	9	18	35
TLC<3500	29	24	104	157
3500-10,000	12	62	82	156
>10,000	37	110	170	317

Table 5 elaborates Lab investigations noted in dengue fever patients. Based on the above symptoms and signs and relevant investigations were sent and evaluated. Evidence of raised haematocrit >35% were observed in 5% of cases more in age group of >6years; Thrombocytopenia (<1-lakh) was observed in 53% of cases with 21% of patients having counts, which was <50,000/mm, but major proportion of the cases had platelet count between 50,000 and 1-lakh. Leukopenia (<3500) was observed in 25% of cases and high counts were seen in 50% of children. Anaemia was seen in 57% out of which severe anaemia was seen in 8.2% of the children.

**Table 6 : Dengue serology in study population**

	NS1	IgG Positive	IgM Positive	IgG + IgM Positive	All Positive	Total
1- 3 Years	6	10	Nil	38	24	78
3 - 6 Years	8	Nil	Nil	164	24	196
>6years	14	Nil	Nil	296	46	356

Prolonged prothrombin time and activatedpartial thromboplastintime were seen in 9 children.PS for MP was positive in 123 patients out of 259 children which were suspected and sent.Widal was positive in 10 patients out of 86 suspected patients sent for Widal. Nonstructural protein 1 antigen test was only positive in 28 children, IgM or IgG or all the three were positive in other all children were classified accordingly in Table 6 in 38% and dengue IgG (along with NS1 antigen or IgM) was positive in 14.9% of cases.

## Discussion

A total of 630 cases of Dengue were enrolled during the study period from February 2014 to February 2015. The most common age group affected was more than 6 years which is in accordance with other studies(5,6). As reported by WHO we noted in our study, children in the rural areas are more affected (74%) than compared to urban population. Fever of 3 - 5 days duration was common finding in all age groups. High grade fever more than 103f was less commonly seen. Rash was seen in age group of 1 -3 years and age more than 6 years. Rash in upper limb alone and lower limb alone are significantly observed in age group of more than 3 years. Pain in abdomen is more seen in children more than 6 years but respiratory symptoms are commonly seen in age less than 6 years. Hematemesis is not a consistent finding in these children. Convulsions are more commonly seen in age group of 1 -3 years than other age groups. Temperature between 100 - 103f was common finding in all age groups. Hepatomegaly was significantly seen in age group of 1 - 3 years. Thrombocytopenia has no relation to severity of the disease as observed in the study. Systemic findings are more common between 1 - 3 years of age. Normal platelet count were more commonly found. Increased haematocrit was not a significant finding. Epistaxis and malena were the most common bleeding manifestations noted which was similar to observations made in other studies(5). Most of the findings are in accordance with the previous studies.(2,3,4,5,6)

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