

**CLINICAL PROFILE OF DENGUE FEVER IN PAEDIATRIC PATIENTS IN A TERTIARY CARE HOSPITAL**

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**ABSTRACT****BACKGROUND**

Prevalence of dengue has been steadily increasing over last few years in South East Asia including India. Increased number of epidemics has been reported in last few years (WHO 2008). Usually dengue viral infection is self-limiting but complications may cause high morbidity and mortality. Case fatality rate has been reported around 1 percent.

Objectives-

1. To assess the clinical profile of dengue infection in children less than 12 years.
2. To study the epidemiology and evaluate the outcome of dengue fever.

**MATERIALS AND METHODS**

A retrospective-descriptive design was adopted. Indoor record papers of patients admitted with confirmed dengue cases in paediatric ward from October 2016 to September 2017 were studied. Dengue NS1 antigen, dengue IgM and IgG were taken as confirmation of dengue infection.

**RESULTS**

Out of 117 cases, 78 were male and 39 were female. Maximum number of cases were seen in the age group of 4-12 years. In our study as per WHO classification, we have categorised 43 children with dengue without warning signs, 59 dengue with warning signs and 15 severe dengue. Fever was seen in 100% cases. Among children with warning signs, predominant features noted were puffiness of face (38%), abdominal distention (30%), abdominal pain (27%), and headache (26%). Hepatomegaly was seen in 50.42%. In severe dengue category, 6 (40%) had bleeding, 4 (26.66%) had CNS involvement, 4 (26.66%) had bilateral pleural effusion and 1 (6.66%) had intractable shock. Laboratory parameters seen were, raised haematocrit (64.95%), leucopenia (47.86%) and thrombocytopenia (69.23%). Blood transfusion was given in 2 patients and platelet transfusion was given in 2 patients. 1 (0.85%) patient died.

**CONCLUSION**

Dengue is commonly seen in children in the age group of 4-12 years. Signs of plasma leak are reliable indicators of the severity of disease. Laboratory parameters like leucopenia, raised haematocrit and thrombocytopenia along with raised SGOT were strongly associated with risk of developing complications. Early institution of fluid therapy according to WHO guidelines, results in favourable outcome.

**KEYWORDS**

Dengue, WHO [World health Organization], Clinical Profile, Children.

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**BACKGROUND**

Globally, dengue is considered to be the most important mosquito borne infection, which is endemic in more than 100 countries.<sup>[1]</sup> Especially in South-East Asia, it is a major cause of morbidity and mortality.<sup>[2]</sup>

The epidemiology of dengue is changing dramatically over every year with respect to strain, presentation and severity of the disease.

There have been several outbreaks in India. Over 2.5 billion people (>40% of world's population) are now at risk from dengue.<sup>[3]</sup> According to WHO, approximately 50 to 100 million dengue infections may be occurring each year. Around 5 lakh people with severe dengue need hospitalisation annually. Children form a large proportion of this burden, 2.5% of those affected die.<sup>[4]</sup> India contributed 34% of global dengue infection in 2010.<sup>[5]</sup> Cyclic epidemics are increasing in frequency and dengue is no longer a disease of urban India, rural is equally affected.<sup>[6]</sup> It has been reported in India that approximately 20% of cases had occurred in infants less than 1 year of age. Male, female patients are affected equally.<sup>[7]</sup>

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**Aims & objectives**

1. To assess the clinical profile of dengue infection in children less than 12 years.
2. To study the epidemiology and evaluate the outcome of dengue fever.

**MATERIALS AND METHODS**

A retrospective-descriptive design was adopted and ethical committee approval was taken. Indoor record papers of patients admitted with confirmed dengue cases in paediatric ward of Rajiv Gandhi Medical College and Chhatrapati Shivaji Maharaj Hospital from October 2016 to September 2017 were studied. Dengue NS1 antigen, dengue IgM and IgG were taken as confirmation of dengue infection.

**RESULTS**

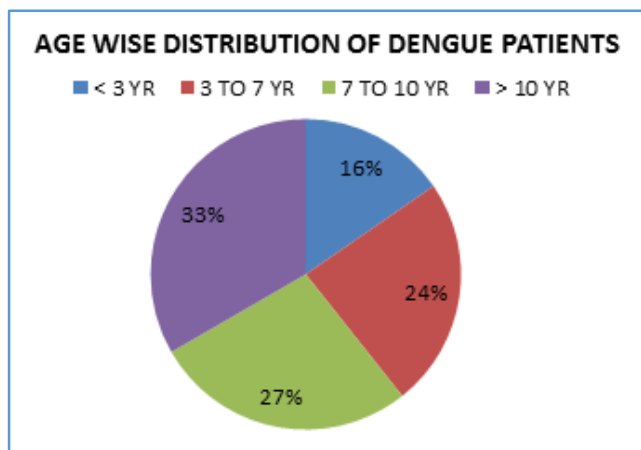
The total number of cases included in this study were 117, out of which, 43 (36.75%) cases were of dengue fever without warning signs, 59 (50.43%) cases were dengue fever with warning signs, and 15 (12.82%) cases were of severe dengue, according to WHO guidelines.<sup>[8]</sup>

There were 78 (66.66%) males and 39 (33.33%) females in our study. In both the groups of severe and non-severe dengue, males had high incidence. The maximum number of cases 39 (33.33%), was seen in the age group above 10 years.

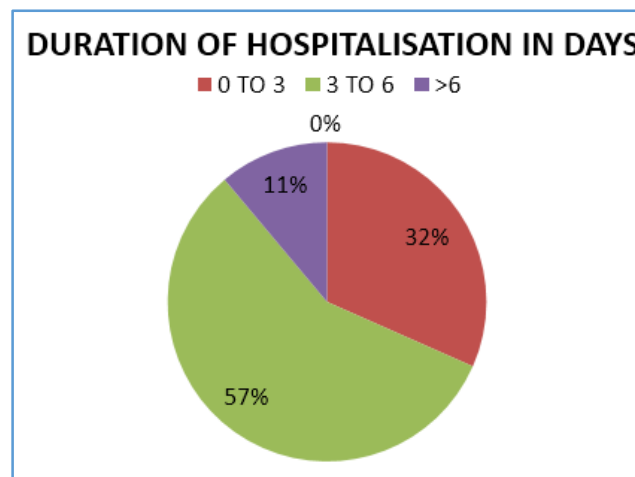
67 (57.26%) of patients were admitted in the hospital for 3–6 days. 11 children out of 15 severe dengue patients were admitted for more than 6 days. Table 1 shows age wise distribution of cases and duration of stay in hospital.

Parameters	Variables	Without Warning Signs [n=43]	%	With Warning Signs [n=59]	%	Severe Dengue [n=15]	%	Total [n=117]	%
Age in Years	< 3	15	34.88	3	5.08	0	0.00	18	15.38
	3 TO 7	8	18.60	15	25.42	5	33.33	28	23.93
	7 TO 10	8	18.60	18	30.51	6	40.00	32	27.35
	> 10	12	27.91	23	38.98	4	26.67	39	33.33
	TOTAL	43	100	59	100	15	100	117	
Duration of Stay In Days	0 TO 3	30	69.77	7	11.86	0	0.00	37	31.62
	3 TO 6	13	30.23	50	84.75	4	26.67	67	57.26
	>6	0	0.00	2	3.39	11	73.33	13	11.11

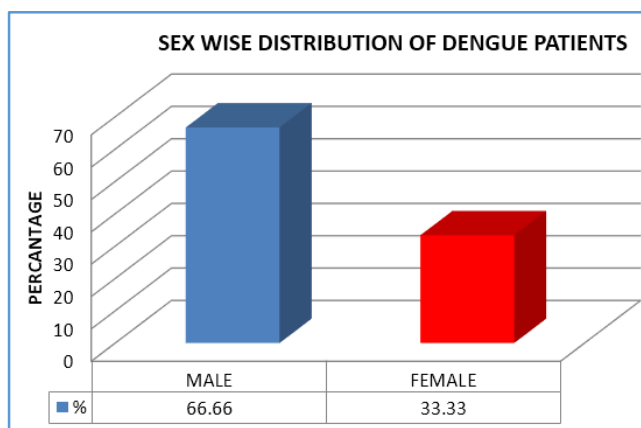
*Table 1. Shows age wise Distribution of Cases and Duration of Stay in Hospital*



*Figure 1. Age wise Distribution of Dengue Patients*

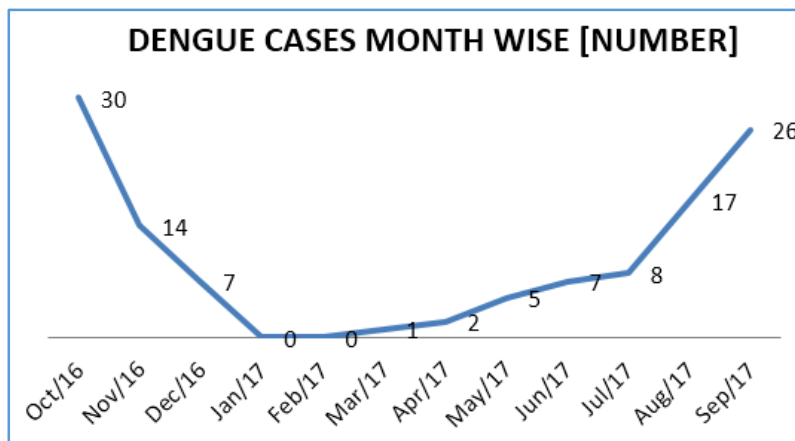


*Figure 3. Duration of Hospitalisation in Days*



*Figure 2. Sex wise Distribution of Dengue Patients*

The majority of the cases were admitted in the rainy and winter season between the months of August and November. The peak of admissions was seen in the month of October with 30 cases (25.64%). The least number of admissions were seen in early summer season, specifically in the month of January to April consisting of 3 cases (2.6%).

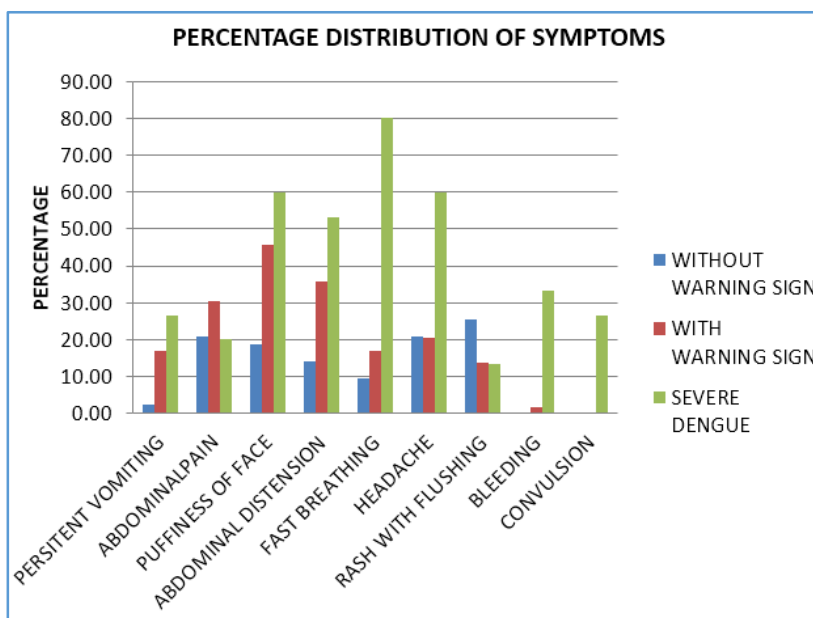


**Figure 4. Season wise Distribution of Dengue Fever Patients**

Fever was present in 100% of the cases; most common presentation was puffiness of face (44, 37.61%) and abdominal distension (35, 29.91%). Rash with flushing (11, 25.58%) and headache (9, 20.93%) were the commonest symptoms in dengue without warning signs. Puffiness of face (27, 45.76%), abdominal distension (21, 35.59%) and abdominal pain (18, 30.51%) were common symptoms

amongst dengue with warning signs, whereas fast breathing in 12 (80%), headache in 9 (60%) and puffiness of face in 9 (60%) were common presenting symptoms in severe dengue.

Serious manifestations like bleeding were seen in 6 (5.13%) cases of which 5 were seen in severe dengue and only 1 case was seen in dengue with warning signs, 4 (3.42%) cases of convulsions were seen only in severe dengue cases.



**Figure 5. Shows a Percentage Distribution of Symptoms According to WHO Classification of Dengue**

In investigations, leucopenia (56, 47.86%) was the predominant finding, followed by leucocytosis (45, 38.46%). Normal leucocyte count was seen in only 16 (13.68%).

Thrombocytopenia (less than 1 lakh) was seen in 81 (69.23%) cases out of which 39 (33.33%) cases had platelet count less than 50,000.

Raised haematocrit (>35%) was observed in 76 (64.96%) cases. It was a predominant feature in severe dengue (13, 86.67%) and dengue with warning signs (48, 81.36%). Among the liver enzymes, SGOT was elevated in a larger proportion (49, 41.88%) of patients when compared to SGPT which was 32 (27.85%). 26 (22.22%) of the cases were

detected to have pleural effusion on chest X-ray (PA view). Right-sided effusion (20, 17.09%) was most commonly seen. Bilateral effusion was seen in 6 (5.13%) cases, of which 4 cases were in severe dengue.

Ultrasound of the abdomen detected hepatomegaly in 59 (50.43%) of the cases, which is the most common finding followed by splenomegaly (40, 34.19%) and ascites (24, 20.51%).

In our study, the majority of the patients were positive for NS1 69 (58.97%), IgM was positive in 30 (25.64%) and IgG was positive in 12 (10.25%). Co-infection with malaria was seen in 30 (25.64%) cases.<sup>[9]</sup>

Investigation	Variables	Without warning signs [n=43]	%	With warning signs [n=59]	%	Severe dengue [n=15]	%	Total	%
TLC	<4000	11	25.58	36	61.02	9	60.00	56	47.86
	4000 - 11000	5	11.63	9	15.25	2	13.33	16	13.68
	>11000	27	62.79	14	23.73	4	26.67	45	38.46
Platelet	>100000	26	60.47	9	15.25	1	6.67	36	30.77
	50000 - 100000	15	34.88	22	37.29	5	33.33	42	35.90
	<50000	2	4.65	28	47.46	9	60.00	39	33.33
SGOT	50 - 200	10	23.26	16	27.12	2	13.33	28	23.93
	200 -1000	2	4.65	11	18.64	5	33.33	18	15.38
	>1000	0	0.00	1	1.69	2	13.33	3	2.56
	Total	12	27.91	28	47.46	9	60.00	49	41.88
SGPT	50 - 200	9	20.93	11	18.64	3	20.00	23	19.66
	200 -1000	0	0.00	4	6.78	3	20.00	7	5.98
	>1000	0	0.00	1	1.69	1	6.67	2	1.71
	Total	9	20.93	16	27.12	7	46.67	32	27.35
HCT	>35	15	34.88	48	81.36	13	86.67	76	64.96
	<35	28	65.12	11	18.64	2	13.33	41	35.04
CXR [Pleural Effusion]	Right	3	6.98	13	22.03	4	26.67	20	17.09
	Bilateral	0	0.00	2	3.39	4	26.67	6	5.13
	Total	3		15		8		26	22.22
USG Abdomen	Hepatomegaly	17	39.53	31	52.54	11	73.33	59	50.43
	Splenomegaly	8	18.60	19	32.20	13	86.67	40	34.19
	Ascites	4	9.30	11	18.64	9	60.00	24	20.51
Dengue Serology	NS1	31	72.09	31	52.54	7	46.67	69	58.97
	IgM	9	20.93	13	22.03	8	53.33	30	25.64
	IgG	1	2.33	10	16.95	1	6.67	12	10.25
	NS1+IgM	1	2.33	4	6.78	0	0.00	5	4.27
	IgM+IgG	1	2.33	1	1.69	1	6.67	3	2.56
Other	Malaria	8	18.60	14	23.73	8	53.33	30	25.64

**Table 2. Shows Investigations of Dengue Cases**

All 117 patients had fever and they were treated with antipyretics (Paracetamol) in appropriate doses. Patients who presented with warning signs and stable vital signs were initially encouraged to take oral fluids; if they were not tolerated; intravenous fluids were started according to the WHO guidelines.

Whole fresh blood transfusion was needed in 2 (1.71%) of the cases and both were severe dengue cases. In our study, 1 case expired due to ARDS with profuse GI bleed and intractable shock. Rest all 116 patients recovered.

## DISCUSSION

Dengue is an important arboviral infection in tropical countries. Global incidence of dengue fever has increased dramatically in the recent decades.<sup>[10]</sup> There are very few studies based on the revised dengue classification. Based on the WHO TDR 2009 dengue guidelines, in our study, total of 117 cases were enrolled and analysed. Out of these, 43 (36.75%) were categorised as dengue fever without warning signs, 59 (50.42%) were dengue with warning signs, and 15 (12.82%) were severe dengue fever. Majority of the patients were in age group of 4-12 years which is in accordance with other studies.<sup>[11,12]</sup> Boys were more commonly affected than girls. Girls wearing body covering clothes could be a factor; also boys are more likely to be brought to the hospital due to gender bias.

In our study, like most other studies, fever was present in all the cases, on analysing warning signs, puffiness of face,

abdominal pain, abdominal distention, headache were seen commonly.<sup>[13]</sup> These findings pointed towards increased frequency of patients with plasma leaks. Hepatomegaly was an important finding in majority of cases. Bleeding was seen in 6 patients, out of which 2 had haematuria, 1 had epistaxis, 1 had melaena, 1 had haematemesis and 1 patient had massive GI bleed with ARDS with intractable shock. Bleeding had no direct correlation with platelet count as seen in other studies.<sup>[14]</sup> CNS involvement was seen in 4 patients out of which 3 patients had convulsions and one was comatose, MRI of that patient showed finding consistent with dengue encephalopathy.<sup>[12,15]</sup>

In our study, concomitant presence of leucopenia, raised haematocrit and low platelet count was commonly associated with dengue fever with warning signs.

Decreasing sequential leukocyte count with increasing haematocrit and decreasing platelet count were reliable indicators of developing complications. Prompt fluid therapy as per WHO protocol resulted in improvement in majority of the cases.<sup>[11,12,14]</sup>

In our study, liver enzymes were in the range of 200 - 1000, only 3 patients had more than 1000; it had strong correlation with the severity of the disease, as noted in other studies.<sup>[12,16]</sup>

Hepatomegaly, ascites and pleural effusion were common USG findings like other studies.<sup>[14]</sup>

In dengue serology, 69 were NS1 positive, 30 were IgM positive and 12 were IgG positive indicating secondary

infection. Because all were sick on admission NS1 and IgM tests were done.<sup>[17,18]</sup> NS1 antigen detection was found to be reliable and sensitive early indicator of dengue infection. All children requiring IV fluids received crystalloids, colloids were not used. Blood transfusion was required in 2 patients, while platelet transfusion was given in 2 patients who had bleeding.

### CONCLUSION

In summary, children in the age group of 4-12 were commonly affected by dengue infection. Signs of plasma leak like puffiness of face, abdominal distention and pleural effusion were found to be reliable indicators of the severity of disease helping in early institution of fluid therapy according to WHO guidelines, resulting in favourable outcome. Laboratory parameters like leucopenia, raised haematocrit and thrombocytopenia along with raised SGOT were strongly associated with risk of developing complications. This study will add to the existing knowledge about the disease and its management and will help in improving outcome and decreasing case fatality rate.

### Abbreviations

SGOT: Aspartate transaminase.

SGPT: Alanine aminotransferase.

Hb: Haemoglobin.

HCT: Haematocrit.

WHO: World Health Organization.

DHF: Dengue haemorrhagic fever.

DSS: Dengue shock syndrome.

IgM antibody: Immunoglobulin M antibody.

IgG antibody: Immunoglobulin G antibody.

DF: Dengue fever.

USG: Ultrasonography.

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