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CLINICAL AND LABORATORY PROFILE OF DENGUE IN CHILDREN

Paediatrics

Riya George	D Y Patil Medical College, Hospital & Research Centre, Nerul, Navi Mumbai
Keya Lahiri	D Y Patil Medical College, Hospital & Research Centre, Nerul, Navi Mumbai
Mumtaz Sharif	D Y Patil Medical College, Hospital & Research Centre, Nerul, Navi Mumbai
Chinmay Chaudhari	D Y Patil Medical College, Hospital & Research Centre, Nerul, Navi Mumbai

ABSTRACT

Background: Dengue is a mosquito-borne viral illness with manifestations that range from a severe flu-like illness to life-threatening complications

Objective: To study the clinical & laboratory profile of Dengue in Children.

Methods: The study was conducted in a tertiary care centre from August to October 2015 in 73 children below 12 years of age who were tested positive for Dengue infection by NS1 assay or ELISA. Clinical and laboratory parameters were recorded & analyzed statistically. A "p" value of < 0.05 was considered positive.

Results: Out of the 73 NS 1 assay confirmed dengue cases, all subjects had fever, while cough and cold was a common symptom in all age groups. Significant leucopenia and thrombocytopenia was not seen in our subjects.

Conclusion: Early recognition and prompt management is essential to reduce the morbidity and mortality associated with disease.

KEYWORDS

Dengue, clinical features, laboratory

I. INTRODUCTION

"Dengue" is derived from a Swahili word for "bone breaking fever'. Dengue, a major public health problem causing significant morbidity, mortality and economic loss in tropical and sub-tropical countries like India. Worldwide around 3.9 billion people live in dengue prone regions and about 96 million new cases are detected each year [(1)].

The season of disease transmission of Dengue is in monsoon and post monsoon. In India, Dengue fever was first reported from Vellore district in the state of Tamil Nadu in 1956. Every year there is an increasing trend of incidence of Dengue fever & Dengue Hemorrhagic Fever. In last 10 years, major outbreaks and death have occurred in all major regions of the country with the case fatality rate going above 1% of the cases [(2)]. In India the annual incidence is estimated to be 7.5 to 32.5 million [(3)].

This study aims to assess the clinical and laboratory profile of paediatric patients below 12 years of age suffering from Dengue Fever in a Tertiary Care Centre in Navi Mumbai, Maharashtra.

II. MATERIALS & METHODS

The present prospective study was conducted in Dr. D. Y. Patil Medical College, Hospital & Research centre, Navi Mumbai, Maharashtra. The study period was from August to October 2015. Patients enrolled were children below 12 years of age, who were who were admitted in the IPD department of the hospital and tested positive for Dengue infection by NS1 or ELISA.

An informed consent was taken from the parents. A detailed proforma questionnaire was prepared and each patient was assessed according to the proforma.

Symptoms such as Fever, Bodyache, Vomiting, Loose Stools, Cold, Cough, Headache, Pain in Abdomen, Convulsions, and Breathlessness were recorded in each patient.

Laboratory parameters such as Haemoglobin, Packed cell volume, White Blood cell count, Platelet Count, Liver Function Tests & Coagulation Profile was done in each patient. Relevant radiological investigations like USG of abdomen, chest X-ray were done in cases where required.

Serial monitoring of platelet count and haematocrit levels was performed during the hospital stay. The patients were treated as per treatment guidelines by WHO that consisted of anti-pyretics (paracetamol), isotonic I.V. fluids and whole blood, platelet transfusions, inotropes where required.

The data collected was statistically analysed. The statistical analysis using SPSS software & Chi Square test was done. A 'p' value of < 0.05 was considered positive.

III. RESULTS

From the study it is observed that maximum number of subjects fall in the age group of 8 to 12 years.

Table 1: Age-wise distribution

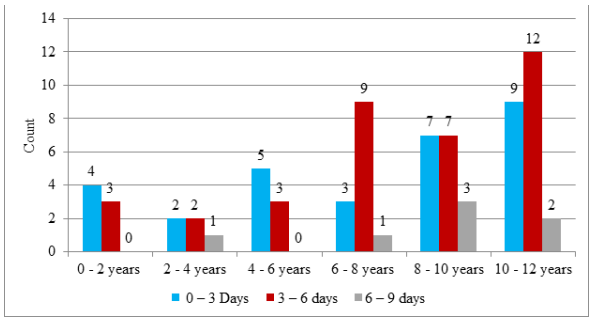
Age Group (Years)	No. of children
0 - 2 years	7
2 - 4 years	5
4 - 6 years	8
6 - 8 years	13
8 - 10 years	17
10 - 12 years	23
Total	73

Table 2: Gender Profile

Age groups	Female	Male	Total	P-Value
0 - 2 years	3	4	7	**0.376**
2 - 4 years	3	2	5	
4 - 6 years	6	2	8	
6 - 8 years	5	8	13	
8 - 10 years	7	10	17	
10 - 12 years	9	8	17	
12 – 14 years	1	5	6	
Total	34	39	73	

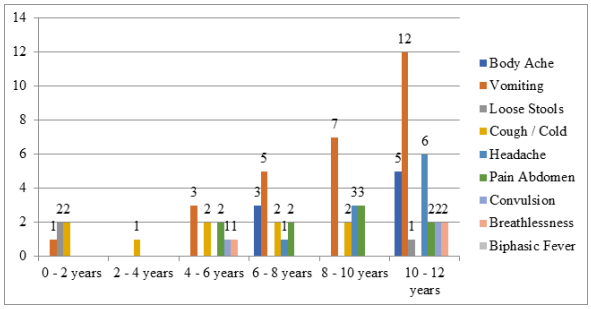
Out of the 73 confirmed cases of dengue, 39 (53.4%) were males and 34 (46.5%) were females which was almost equal. Fisher Exact test was applied and P-Value of 0.376 was obtained. Therefore, there was no gender bias in this study.

Figure 1: Fever in the study group (according to duration)



In the above study, 9 children had fever within 0-3 days, 12 children had fever within 3-6 days & 2 children had fever to 6 - 9 days from the age group of 10-12 years. Fisher Exact test was applied and P-Value of 0.335 was obtained. Therefore, Fever was present in 100% cases which was similar to the other studies

Figure 2: Frequency of symptoms for different age groups



In the above study it was observed that almost all age group subjects had Cough and cold. The hallmark symptoms were found to be myalgia, headache & vomiting.

Table 3: Hemoglobin levels Distribution in the study group

Age groups	08-10 g/dl	10-12 g/dl	>12 g/dl	Total	P-Value
0 - 2 years	0	7	0	7	**0.254**
2 - 4 years	1	4	0	5	
4 - 6 years	1	5	2	8	
6 - 8 years	0	10	3	13	
8 - 10 years	2	9	6	17	
10 - 12 years	0	15	8	23	
Total	4	50	19	73	

In the above study, highest no. of children had hemoglobin between 10 – 12 gm/dL. Fisher Exact test was applied and P-Value of 0.254 was obtained. Therefore, No Significant difference found.

Table 4: Packed Cell Volume in the study group

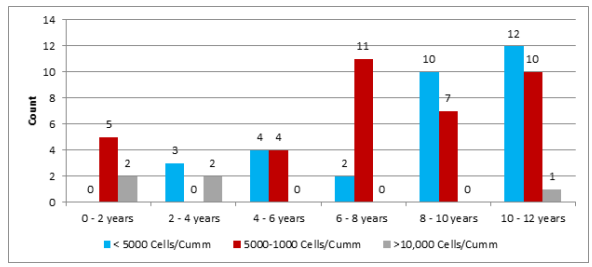
Age groups	30-33 %	33-36 %	36-39 %	> 39 %	Total	P-Value
0 - 2 years	0	7	0	0	7	**0.086**
2 - 4 years	1	4	0	0	5	
4 - 6 years	1	5	0	2	8	
6 - 8 years	1	5	6	1	13	
8 - 10 years	1	4	6	6	17	
10 - 12 years	0	4	13	6	23	
Total	4	29	25	15	73	

In the above study, highest number of children had PCV between 33 – 36 %. Fisher Exact test was applied and P-Value of 0.086 was obtained. Therefore, significant hemoconcentration was not found in majority of cases.

Table 5: White Blood Cell count distribution in the study group

Age groups	< 5000 Cells/mm3	5000-10,000 Cells/mm3	>10,000 Cells/mm3	Total	P-Value
0 - 2 years	0	5	2	7	**0.024**
2 - 4 years	3	0	2	5	
4 - 6 years	4	4	0	8	
6 - 8 years	2	11	0	13	
8 - 10 years	10	7	0	17	
10 - 12 years	12	10	1	23	
Total	31	37	5	73	

Figure 3: White Blood Cell count distribution in the study group



In the above study, highest number of children had leukocyte count between 5,000 – 10,000. Fisher Exact test was applied and P-Value of 0.024 was obtained. Therefore, leukopenia was found in 42.4% cases.

Table 6: Platelets count distribution in the study group

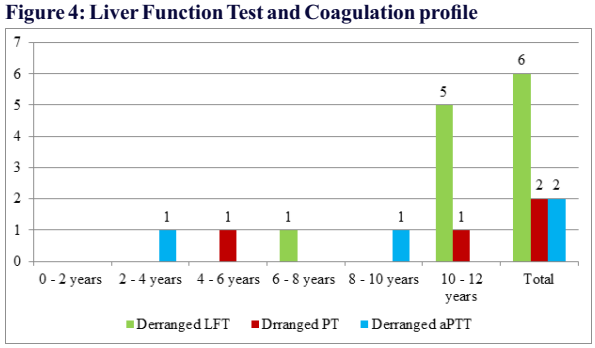
Age groups	< 50,000/ mm3	50,000-100,00/mm3	> 1,00,000/ mm3	Total	P-Value
0 - 2 years	0	1	6	7	0.621
2 - 4 years	0	0	5	5	
4 - 6 years	0	1	7	8	
6 - 8 years	1	0	12	13	
8 - 10 years	1	2	14	17	
10 - 12 years	0	4	19	23	
Total	2	8	63	73	

Severe thrombocytopenia was seen in 2 (2.7%) cases while moderate thrombocytopenia was seen in 8 (10.9%) cases. Maximum cases (86.3%) had platelet count >1,00,000. Fisher Exact test was applied and P-Value of 0.621 was obtained. Therefore, thrombocytopenia was not found in majority cases.

Table 7: Liver Function Test and Coagulation profile

Age Group	LFT		PT		APTT	
	Normal	DERANGED	Normal	DERANGED	Normal	DERANGED
0 - 2 years	5	0	5	0	5	0
2 - 4 years	1	0	1	0	0	1
4 - 6 years	5	0	4	1	5	0
6 - 8 years	10	1	11	0	11	0
8 - 10 years	10	0	10	0	9	1
10 - 12 years	13	5	17	1	18	0
Total	44	6	48	2	48	2
P-value	0.426		0.531		0.018	

Figure 4: Liver Function Test and Coagulation profile



In the above study the liver function tests and coagulation profile was studied in only 50 cases of which, 6 (12%) cases had deranged LFT, 2 (4%) patients had deranged PT and 2 (4%) patients had deranged aPTT. P -values for each of the test were 0.426, 0.531 & 0.018. There was statistically significant difference found for aPTT.

IV. DISCUSSION

Dengue is an important disease in Pediatric population of the tropical and sub-tropical regions like India. In our study maximum number of patients were admitted in the rainy season (August to October) that is co insides to the favorable conditions for growth of dengue vector Aedes aegypti[4]. The transmission of dengue fever is maximum during monsoon season and the correlation between occurrence of dengue fever and monsoon is clearly evident in this study. Majority cases were between 8 – 12 yrs which corresponded to studies by NL Sharma [5] et al and S Mishra et al [6].

Fever present in 100% cases. The hallmark symptoms were myalgia, headache & vomiting; while cough and cold was seen in all cases. These findings correlate with other studies in the same geographical region. Majority cases had Haemoglobin between 10 – 12 gm/dL. WBC more than 10000 in 37 (50.68%) cases suggesting that leukopenia was absent in majority cases while leucopenia was observed in 42.4% cases which was similar to 47.1% by I Shah et al [7] and 41.4% R Singh et al [8].

Severe thrombocytopenia was seen in 2.7% cases, moderate thrombocytopenia was seen in 10.9% cases and platelet count of more than 1 lakh was seen in 63 (86.3%) cases. This finding shows us that in dengue fever a patient can also present with a normal platelet count. Bleeding manifestations were present in almost all cases of thrombocytopenia. In 12% cases, the liver function test was deranged and coagulation profile was deranged in 5.4% cases. These findings were consistent with the findings seen in the general population suffering from dengue fever in this region as shown by other studies. The complications of dengue fever were absent in most cases.

V. CONCLUSION

In the pediatric age group, Dengue fever is one of the most dreaded fevers which presents with variable presentations and complications. We, as clinicians, need to have the complete understanding of varied presentations and its associated features which would help us to predict the severity of Dengue. In our study, we have listed all the probable clinical presentations and the relevant laboratory parameters that can help us in establishing the severity of the fever. Age preponderance, normal leukocyte & platelet counts, deranged LFT, deranged Coagulation profiles are significant findings in distinguishing severe from non-severe cases of dengue fever. Our knowledge about these features of the disease will help in better management of the cases that will in turn lead to a better outcome of Dengue cases. One should have a high index of suspicion of Dengue in view of the increasing burden of cases on the public health-care system of our country. Our early diagnosis and prompt intervention may help in significantly reducing the mortality and morbidity associated with this dreaded disease.

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Conflict of interest: None declared
Ethical approval: The study was approved by the institutional ethics committee

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