

Study of Dengue Serological Marker and Platelet Counts

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Abstract: Dengue virus is widely distributed throughout the tropics and subtropics. Dengue virus infection has emerged as a notable public health problem in coastal regions. Apart from the dengue specific parameters, platelet count is the only accessory laboratory test available that can support the diagnosis of DHF or DSS. This present work was planned to study Correlation of Platelet count and diagnosis of dengue by IgM ELISA in tertiary care Hospital.

Keywords: Dengue virus, IgM ELISA, platelet count, Thrombocytopenia

1. Introduction

Dengue is an arboviral disease caused by Dengue virus (DENV) belonging to the family Flaviviridae and genus flavivirus.

- It is one of the most serious mosquito-borne viral diseases in humans affecting tropical and subtropical regions of the world.
- It is estimated that, approximately 50 million dengue infections occurs worldwide every year. Out of which 5,00,000 cases are hospitalized with Dengue Hemorrhagic Fever (DHF) annually. Nearly 90% of them are children less than 5 years old, and about 2.5 percent are dying.
- In peripheral areas newer diagnostic methods are not available. The only tool in their hands is measuring the platelet count, and it is the only accessory laboratory test that can support the diagnosis of DHF.

2. Aims

To detect IgM antibody by ELISA in Dengue suspected cases.

- To measure the platelet counts in dengue IgM positive cases.
- To study the association of dengue antibodies and platelet count with clinical presentation of disease.
- Study design: Prospective study

3. Materials and Methods

- Study group: A total of 965 clinically suspected cases of dengue reported to various outpatient departments, emergency services and inpatients in a tertiary care hospital were included in the study.
- Study Period: June 2017 – November 2017.
- Inclusion criteria:
 - ❖ Sudden onset fever (39-40°C) of 2-7 days duration
 - ❖ Intense headache with retro-orbital pain
 - ❖ Myalgia, Arthralgia
 - ❖ Rash
- Exclusion criteria:
 - ❖ Low grade fever

❖ Fever more than 7days.

- After consent of the patient, about 5ml of whole blood was collected by venepuncture, 3ml transferred to EDTA tube for platelet count and 2ml blood centrifuged and serum was separated and stored at 2-8°C, for performing ELISA.
- If Serum showing hemolysis, icterus, lipemia, those patients were excluded from the study because they may give false positive/ negative interpretation.
- All the serum samples were screened for anti dengue IgM antibodies using Capture ELISA NIV (National Institute of Virology) Pune. As recommended by National Vector Borne Disease Control (NVBDCP, Delhi).
- Platelet counts evaluated by fully automated hematology 5 part analyser (sys mex).

Table 1: Dengue IgM positive cases by ELISA

No. of samples tested	No. of samples positive	Percentage
965	74	7.67%

Out of 965 suspected cases of dengue, 74 were positive for Dengue IgM antibodies.

Table 2: Age-wise distribution among the Seropositive patients (n=74)

Age (Years)	No. of Cases	Percentage
1-10	2	2.7%
11-20	19	25.6%
21-30	33	44.5%
31-60	16	21.6%
61-80	4	5.4%

The age of the seropositive patients ranged between 9 to 78 years. The most affected age group was between 21 to 30 years.

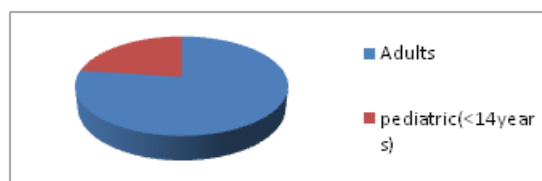


Figure 1: Comparison of Dengue Positives in adult Vs pediatric population (n=74)

Table 3: Gender-wise distribution among the Seropositive patients (n=74)

Males	Females
48(64.9%)	26(35.1%)

The male to female ratio of the seropositive patients was 2:1

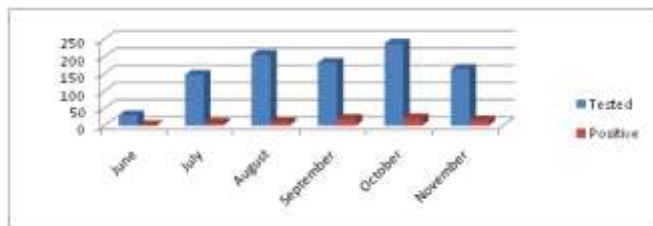


Figure 2: Month wise Dengue seropositivity

Maximum number of dengue positive samples was observed in the month of October.



Figure 3: Comparison of Dengue Positives in Urban Vs Rural (n=74)

Out of 74 Dengue positive cases, 48 were from Urban areas and 26 were from Rural area.

Table 4: Platelet count of positive dengue cases

Platelet count	Dengue Positive cases	Transfusion
<20,000	3	Done
20,000-50,000	4	Done
50,000-80,000	18	Nil
80,000-1,00,000	10	Nil
1,00,000-1,50,000	24	Nil
>1,50,000	15	Nil

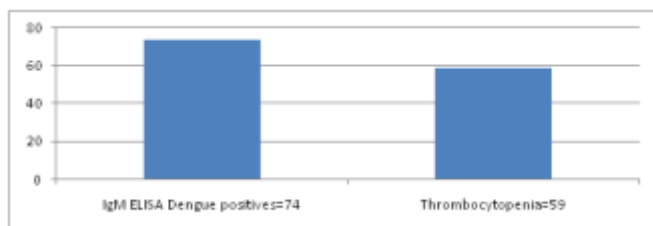
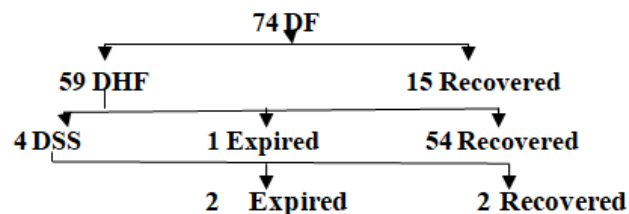


Figure 2: Thrombocytopenia among Dengue positive patients

Table 5: Clinical manifestations of patients with Dengue fever (n=74)

Clinical manifestations	Numbers	Percentage
Fever	74	100
Severe headache	58	78.3%
Nausea & vomitings	48	64.8%
Myalgia	45	60.8%
Rash	35	47.3%
Arthralgia	6	8.1%
Retro-orbital pain	6	8.1%
Gingival bleeding	6	8.1%
GI bleeding	3	4%



4. Discussion

In this study, the epidemiology of dengue in this region showed that most cases occurred in young adults with Male predominance. **Krunal D. Mehta et al. Jamnagar 2016 also reported similar observations in their study.**

Our data shows that the epidemic waves were seen in urban centers, because highly urbanized areas have substantial proportions of the populations living in crowded areas with poor sanitation. **Avinash kumar et al. Delhi August 2017 also reported similar observations in their study.**

Among the clinical signs, we noticed a higher proportion of fever, thrombocytopenia, severe headache, nausea, vomiting, myalgia, and rash in patients with DF. **M Neeraja et al Hyderabad, 2006 also reported similar observations in their study.**

As per WHO guidelines, thrombocytopenia can be used as simple diagnostic criteria for DHF.

5. Conclusion

In the present study 7.67% (74 out of 965) seropositivity was reported for dengue virus infection.

- Thrombocytopenia was noted in 59 cases.
- Among them 3 expired, even after blood transfusion and majority survived even after progression to DHF
- Hence serological marker along with platelet count help the clinician for early prediction & monitoring of the dengue positive cases for the development of DHF and DSS there by reducing the complications.

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