

## Seroprevalance of Dengue Viral Infection in a Tertiary Care Hospital in Kanyakumari District

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### Abstract

**Background:** Dengue fever caused by dengue virus is an acute viral infection associated with significant morbidity and mortality all over the world. This study is conducted to know the seroprevalance of dengue fever in a tertiary care centre at Kanyakumari district.

**Aim:** To determine the prevalence of Dengue in Kanya kumari district of Tamil Nadu.

**Methods:** A total of 176 clinically suspected dengue cases attending the medical OPD of Sree Mookambika Institute of Medical Sciences from March 2021 to March 2022 were included in the study. The samples were collected after taking informed consent from the patient. The samples were screened for IgM and IgG antibody by Enzyme Linked Immunosorbent Assay. The manufacturer instructions were strictly followed.

**Results:** Out of the 176 samples for dengue only 32 (18%) were positive for IgM only, 15 (8.5%) were positive for IgG only and 7 (3.9%) samples were positive for IgM and IgG

**Conclusion:** A significant rise in the prevalence (18%) of primary dengue viral infection cases were reported in the Kanyakumari district of Tamil Nadu.

**Keywords:** Dengue, IgM ELISA, IgG ELISA, Prevalance

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### Introduction

Dengue virus is the most common arboviral diseases in India spread by mosquitoes. Dengue virus is a single positive stranded RNA virus of the family Flaviviridae [1]. The principal vector of Dengue fever is *Aedes aegypti* followed by *Aedes albopictus*. *Aedes aegypti* is a nervous feeder, hence it requires more than one person to complete its blood meal. Therefore *Aedes aegypti* is the most efficient vector. Dengue is endemic in more than 100 countries with 2.5 billion people at risk of which Tropical countries of Southeast Asia and Western Pacific are at higher risk. In India maximum cases have been reported from Kerala, Tamil Nadu, Karnataka, Orissa, Delhi, Maharashtra and Gujara [2,3].

There are 4 serotypes for dengue DEN1, DEN2, DEN3, DEN4. All the four has been isolated from India but DEN1 and DEN2 are most widespread. Primary dengue infection occurs when a person is infected with dengue virus for the first time with any one serotype. Antibody response is slow and is of low titre in primary infection. IgM antibody appears within 5 days of fever and disappears within 90 days

. In secondary Dengue infection severe form of dengue illness may appear due to infection with another dengue serotype different from the first serotype causing infection. IgG antibody rises rapidly in secondary infection. IgG antibody may also be cross-reactive with other flavi viral infection and may give false positive result [4].

In this study we are presenting the seroprevalance of dengue viral infection among the fever patients attending a tertiary care hospital in Kanyakumari district, Tamil Nadu.

### Materials and Methods

A total of 176 clinically suspected dengue cases attending the medical OPD of Sree Mookambika Institute of Medical Sciences from March 2021 to March 2022 were included in the study. The patient had complaints of fever, myalgia arthralgia, and some have developed maculopapular rashes and haemorrhagic manifestations like epistaxis and bleeding gums. Dengue Fever and Dengue Haemorrhagic Fever are diagnosed as per WHO criteria [5].

The study was conducted after receiving permission from Institutional Ethical and Research Committee. Blood samples were collected from 176 clinically dengue suspected patients. The samples were collected after taking informed consent from the patient. The samples were screened for IgM and IgG antibody by Enzyme Linked Immunosorbent Assay. The manufacturer instructions were strictly followed.

**Sample Size Calculation**

**Based on Hypothesis Testing Population Proportion using nMaster 2.0 Sample Size Calculator Software**

**Formula**

$$H_0 : P = P_0 ; \quad H_a : P \neq P_0$$

$$n = \frac{\left\{ Z_{1-\alpha/2} \sqrt{P_0(1-P_0)} + Z_{1-\beta} \sqrt{P_a(1-P_a)} \right\}^2}{(P_a - P_0)^2}$$

Where,

$P_0$  : Population proportion

$P_a$  : Sample proportion

$\alpha$  : Significance level

$1-\beta$  : Power

$P_0 = 0.54$

$P_a = 0.28$

$\alpha = 5\%$

$1-\beta = 80\%$

Sample Size = 176

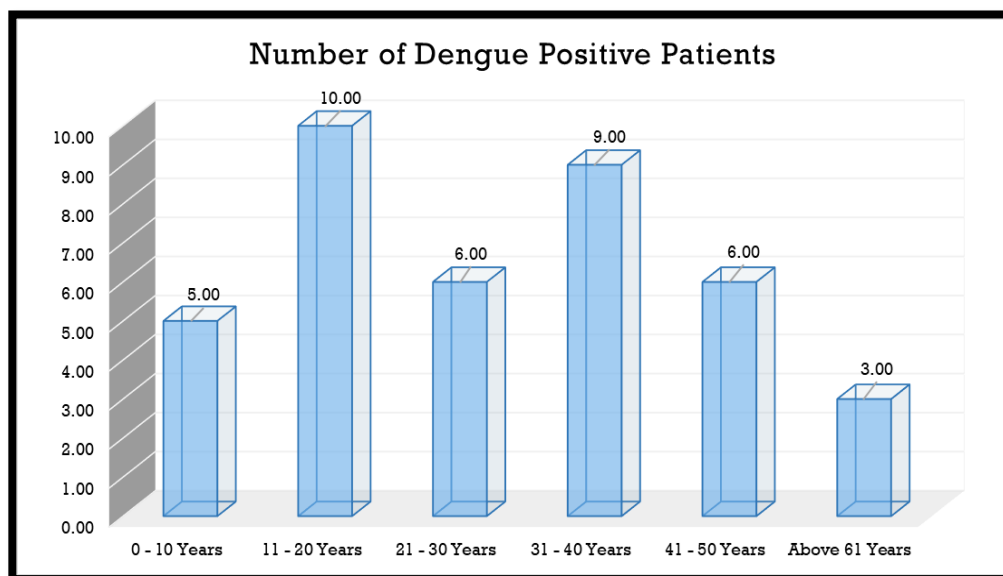
**Results**

Out of the 176 samples screened for both IgM and IgG ELISA, 57 samples were positive for IgM, IgG or both. Out of the 176 samples for dengue only 32 (18%) were positive for IgM only, 15 (8.5%) were positive for IgG only and 7 (3.9%) samples were positive for IgM and IgG. The above serological analysis indicated a seropositivity of 32.3% (57/176) with 18% IgM positivity, 26% IgG positivity and 3.9% IgM and IgG positivity.

**Table 1 shows the age wise distribution of dengue serologically positive patients**

**Table 1: Age wise distribution of dengue patients**

AGE GROUP (in years )	NUMBER OF DENGUE POSITIVE PATIENTS
0-10	5
11-20	10
21-30	6
31-40	9
41-50	6
ABOVE 61	3



**Figure 1: Age wise distribution of serologically positive sample.**

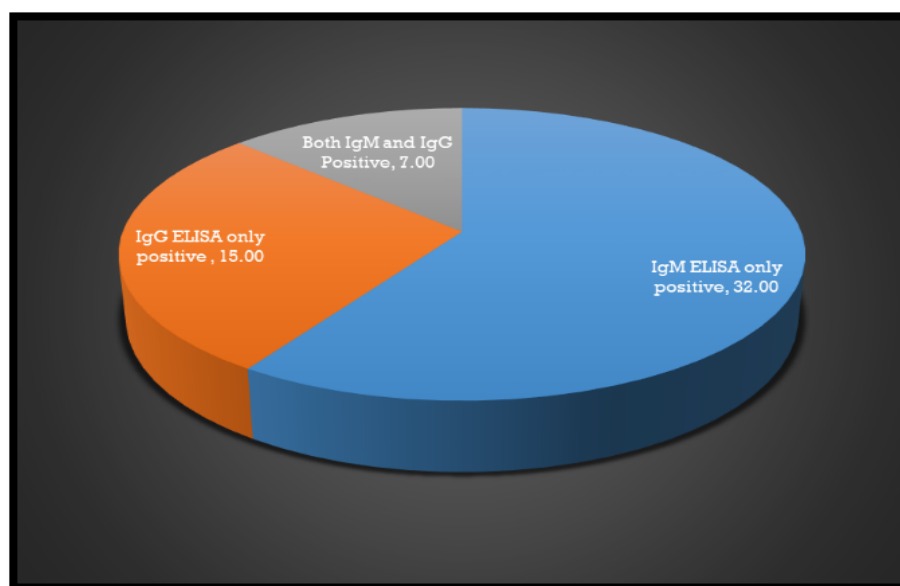


Figure 2: The above pie chart shows the distribution of serologically positive dengue samples

### Discussion

Out of the 176 samples for dengue only 32 (18%) were positive for IgM only, 15 (8.5%) were positive for IgG only and 7 (3.9%) samples were positive for IgM and IgG. The high positivity of IgM antibody over IgG and IgM suggests that primary dengue infection is more common in our tertiary care centre, [6,7].

Age wise distribution of dengue positive samples indicated that young people in the age group of 11-20 years were mostly affected as they are the most active group who stays outdoors and exposed to mosquito bites. This result is in accordance with the studies conducted in South India [8].

The higher prevalence of mosquito born infections like dengue and malaria clearly indicates active control of mosquitoes in the community [9].

### Conclusion

Rapid immunochromatographic test methods are very useful for early diagnosis of dengue infections and case management, where sophisticated infrastructure and expertise are scarce. Active surveillance should be conducted in such areas regularly for early detection and treatment of dengue cases.

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