

Research Article

Seroprevalence of dengue virus in a tertiary care hospital, Andhra Pradesh, South India

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ABSTRACT

Background: Dengue fever and Dengue Haemorrhagic fever (DF/DHF) is an acute viral disease caused by Dengue virus. The infection is transmitted by the bite of an infected female mosquito- *Aedes aegypti*. The Dengue virus causes significant morbidity and mortality in many parts of the world, including India, where it was first isolated in Calcutta, West Bengal during 1945. This study was conducted to know the seroprevalence of Dengue virus in a tertiary care hospital, Hyderabad

Methods: Blood for serological studies are carefully collected taking due universal precautions from suspected DF/DHF cases (a) as soon as possible after hospital admission or attendance. All the patients were screened for anti-Dengue IgG and IgM antibodies By Enzyme Immunoassay. The study period was 18 months from 2012.

Results: From a total of 1327 serum samples tested were screened for Dengue IgM and IgG among which 706(53.2%) were positive. 125(17.7%) were only IgM positive and 198(28.05%) of the tested samples showed only IgG positive. 383(54.25%) of the tested samples revealed positive for both IgM and IgG antibodies.

Conclusion: Surveillance is prerequisite for monitoring the dengue situation in the area and should be carried out regularly for early detection of an impending outbreak and to initiate timely preventive and control measures.

Keywords: DF/DHF, Dengue fever and Dengue Haemorrhagic fever

INTRODUCTION

Dengue fever and Dengue Haemorrhagic fever (DF/DHF) is an acute viral disease caused by Dengue virus. The infection is transmitted by the bite of an infected female mosquito- *Aedes aegypti*. The Dengue virus causes significant morbidity and mortality in many parts of the world, including India, where it was first isolated in Calcutta, West Bengal during 1945. The first major outbreak associated with haemorrhagic manifestation occurred in Calcutta in 1963.

According to World Health Organization (WHO),¹ two-fifths of world's population (i.e. 2500 million peoples)

are now at risk for dengue, and annually approximately 50 million new cases of dengue fever (DF) occur worldwide with 500,000 cases of dengue hemorrhagic fever (DHF) or hemorrhagic fever (DHF) requiring hospitalization every year and mortality rate of 2.5%. There is an increase for global prevalence of dengue fever in recent decades particularly in Americans, Western-Pacific and associated illness, more serious manifestations in South-East-Asia.²

There are 4 antigenically distinct serotypes of the Dengue viruses (DENV-1-4) that can cause human infections.³ The largest Dengue outbreak in India which occurred in 1996, was due to DENV-2.⁴ This was later replaced by

DENV-3, as the dominant serotype in 2003.⁵ The subsequent outbreaks witnessed a mixed type of infection with DENV-1, 2 and 3.^{6,7}

We present the seroprevalence of Dengue virus referred to a tertiary care hospital from in and around Government and private hospitals and clinics of Hyderabad and Districts surrounding Hyderabad for a period of 18 months.

METHODS

A total of 1327 clinically suspected Dengue fever were referred from in and around Hospitals and clinics of Hyderabad and Districts surrounding Hyderabad. Clinically suspected cases of dengue were included in this study irrespective of their age and sex. They had come to the Tertiary care hospital with complaint of fever, headache, malaise, myalgia and arthralgia, or who developed a maculopapular rash on the 3rd or 4th day of illness. Others with haemorrhagic manifestations such as epistaxis, bleeding gums and conjunctival haemorrhage were also included in the study. The cases of DF and DHF were diagnosed as per the criteria laid down by WHO.⁸ All cases were subjected to serological studies. Blood samples are carefully collected taking due universal precautions from suspected DF/DHF cases (a) as soon as possible after hospital admission or attendance. All the patients were screened for anti-Dengue IgG and IgM antibodies By Enzyme Immunoassay (Pan Bio). The study was conducted for a period of 18 months from 2012 at our tertiary health care Hospital, Hyderabad.

RESULTS

From a total of 1327 serum samples were screened for Dengue IgM and IgG among which 706(53.2%) were positive for IgM, IgG or both. Of the 1327 samples screened for both IgM and IgG antibodies 125(17.7%) were only IgM positive and 198(28.05%) of the tested samples showed only IgG positive. 383(54.25%) of the tested samples revealed positive for both IgM and IgG antibodies. The serological analysis of the samples indicated 53.2% seropositivity (706/1327 patients), with 17.7% IgM positivity (125 patients), 28.05% IgG positivity (198 patients) and 54.25% IgM and IgG positivity (383 patients). The serological tests were done by using IgM capture and IgG capture ELISA to discriminate between the high levels of IgG (which were characteristic of the secondary Dengue infections) and the low levels of IgG (which were characteristic of the primary/past Dengue infections).⁹

DISCUSSION

Though Dengue infections were reported in India since the late 1950s, an upsurge in its activity has been noticed since the mid 1990s.¹⁰

In the present study, out of 1327 sera of suspected patients 125 (17.7%) were IgM positive which indicated recent dengue infection. 198 cases (28.05%) were only IgG positive which showed past infection with dengue. Out of this total cases 383 (54.25%) were positive for IgG indicating convalescent phase.

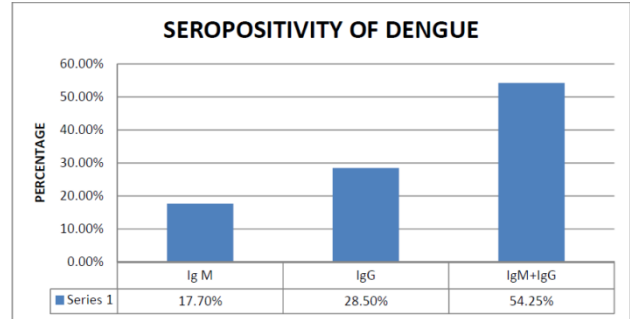


Figure 1: Seropositivity of dengue.

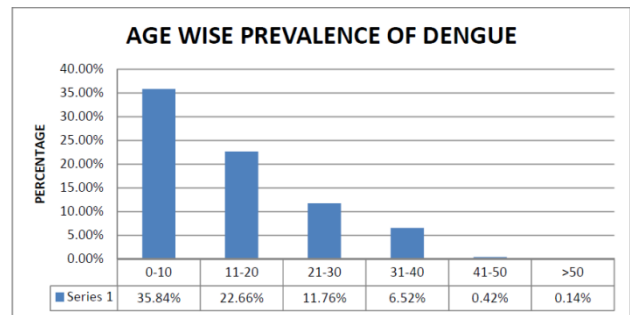


Figure 2: Age wise prevalence of dengue.

Among the seropositives, Anti dengue IgG was positive in 28.05% of the cases, whereas Anti dengue IgM was positive only in 17.7% of the cases. And both Anti dengue IgM and IgG were positive in 54.25% of the cases. The high positivity of both IgM and IgG when compared to the positivity of IgM alone suggests that secondary dengue infection is more common in our tertiary health care centre. This was in accordance with other study⁸ where the seropositives for both IgG and IgM is 55.9%. Age wise distribution of Dengue positive cases in our study clearly indicates that children (<10 yrs) were more commonly affected. Most of the patients in the present study were children (<10 years) as compared to the older age group. This result is quite accordance with studies conducted in South India.^{11,12}

The high prevalence of dengue and malaria is an indication of poor mosquito control by the community and health departments. Dengue infection is under reported because of unavailability of diagnostic facilities in remote and interior areas and also due to high cost in Private sectors.

CONCLUSION

Surveillance is prerequisite for monitoring the dengue situation in the area and should be carried out regularly for early detection of an impending outbreak and to initiate timely preventive and control measures like fever alert surveillance, Sentinel Surveillance sites with laboratory support, Strengthening of referral services, involvement of private sector in sentinel surveillance, Epidemic preparedness and rapid response.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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