



SEROPREVALENCE OF DENGUE VIRUS IN A TERTIARY CARE HOSPITAL

Microbiology

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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.

Materials and 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 was conducted in a total duration of one year.

Results: From a total of 165 serum samples tested were screened for Dengue IgM and IgG among which 88 (53.2%) were positive. 29 (17.7%) were only IgM positive and 46 (28.05%) of the tested samples showed only IgG positive. 89 (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; Dengue Haemorrhagic fever.

Introduction

Dengue is an acute viral infection with potential fatal complications [1]. Dengue fever is a disease caused by a family *Flaviviridae* that are transmitted by mosquito *Aedes aegypti* and also by *Ae. albopictus*. There are four serotypes DV-1, DV-2, DV-3 and DV-4. DV is a positive-stranded encapsulated RNA virus and is composed of three structural protein genes, which encode the nucleocapsid or core (C) protein, a membrane-associated (M) protein, an enveloped (E) glycoprotein and seven non-structural (NS) proteins [1]. All four serotypes can cause the full spectrum of disease from a subclinical infection to a mild self limiting disease, the dengue fever (DF) and a severe fatal disease, the dengue haemorrhagic fever/dengue shock syndrome (DHF/ DSS). The WHO 2009 classification divides dengue fever into two groups: uncomplicated and severe [2].

Dengue infection in a previously nonimmune host produces a primary response of antibodies characterized by a slow and low-titer antibody response. IgM antibody is the first immunoglobulin isotype to appear. In a suspected case of dengue, the presence of antidengue IgM antibody suggests recent infection and IgG antibody indicate past infection. India is one of the seven countries in the South-East Asia region regularly reporting incidence of dengue outbreaks due to its high incidence which constantly threatens the health care system.[3] The prevalence of dengue in Indian subcontinent is changed over time. Previously Dengue was assumed to be an urban disease but from few decade large number of dengue fever cases were reported from bigger cities also. [4]

The purpose of this study was to present a comprehensive report on the prevalence of dengue fever cases in a tertiary care centre.

Materials and Methodology:

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. [6] 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 12 months from at our tertiary health care.

Results: From a total of 165 serum samples tested were screened for Dengue IgM and IgG among which 88 (53.2%) were positive. 29 (17.7%) were only IgM positive and 46 (28.05%) of the tested samples showed only IgG positive. 89 (54.25%) of the tested samples revealed positive for both IgM and IgG antibodies. The serological analysis of the samples indicated 53.2% seropositivity (88/165 patients), with 17.7% IgM positivity (29 patients), 28.05% IgG positivity (46 patients) and 54.25% IgM and IgG positivity (89 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).[11]

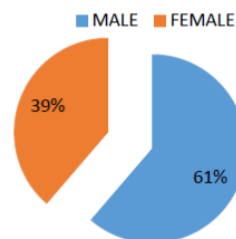


Figure 1: Sex distribution of positive cases.

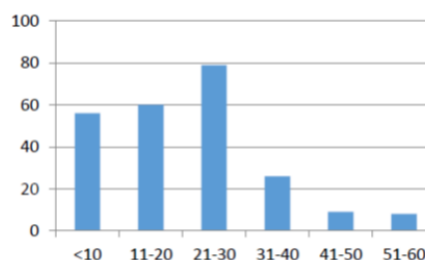


Figure 2: Age distribution of the positive cases.

Discussion:

This study reveals the prevalence of Dengue infection in the tertiary care center. Rain, temperature and relative humidity are reported as the major and important climatic factors, which could alone or collectively be responsible for an infection. Because these environments are very favorable for mosquito breeding that are important source of dengue transmission. In north India, the largest proportion of dengue positive cases. [5]

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

Male were more infected than females, a usual trend seen in this study also other study[7,8,9] also report same result that may because of more exposure of male due to outdoor work.

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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