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Original Research Article

Seroprevalence of dengue infection in clinically suspected cases of dengue at tertiary care hospital in Gujarat

Kinal Shah[1*], Vibhuti Patel[2], Naveen Shah[3]

[1]Associate Professor, [2]Microbiologist, [3]Professor and Head, Dept. of Microbiology, [1,3]Dr. M. K. Shah Medical College & Research Center, Ahmedabad, Gujarat, [2]Civil Hospital, Surat, Gujarat, India

Abstract

Objective: Dengue virus is the most common arbo virus found in India. Our study has conducted to study the epidemiological and demographic characteristic of dengue fever during the year 2017 in Ahmedabad region of Gujarat state India.

Materials and Methods: A retrospective study was performed at the Department of Microbiology, Dr. M.K.Shah Medical College and research centre and smt. S.M.S. multispeciality hospital Ahmedabad, Gujarat from July 2017 to October 2017. A total of 611 blood samples were collected during the study period and serologically tested for dengue NS1 antigen and IgM antibody by capture ELISA testing. Patient with clinically suspected dengue and found positive for dengue NS1 antigen and/or dengue IgM Ab was considered as a case. The data was entered in software and analyzed.

Results: We have tested 611 serum samples for dengue infection during the study period in our hospital. Out of which 104(17%) serum samples were positive for dengue infection. 77 serum samples were positive for Dengue NS1 antigen ELISA and 27 serum samples are positive for Dengue IgM ELISA. Majority of samples were tested positive in age group 14-25 year (64.5%) and 26-60 year (32.7%). It shows prevalence of dengue infection is more in male (82.7%) than female (17.3%).

Conclusion: Rapid urbanization in developing countries increases prevalence of dengue. Virus activity is high during monsoon and post monsoon period which co-insides with increase vector breeding. Effective implementation of vector control measures through efforts toward vector breeding source reduction help in reduction of the dengue prevalence in community.

Keywords: Dengue, NS1 antigen, IgM antibody, Seroprevalence.

Introduction

Dengue virus (DENV) is the most common arbovirus found in India. It is named after the Swahili word "dinga" meaning fastidious or careful, which would describe the gait of person suffering from the bone pain of dengue fever. It has four serotype (DEN-1 to DEN-4) of the genus Flavivirus. Recently, the fifth serotype (DEN- 5) was discovered in 2013 from Bangkok. Aedes aegypti is the principal vector followed by Aedes albopictus. They bite during the day time.[1] These infections may be asymptomatic or may lead to classical dengue fever (DF), or dengue hemorrhagic fever (DHF) with or without shock.[6] Prevalence of dengue infection increase in monsoon and post monsoon period due to proliferation of mosquito breeding sites.

The disease poses a threat to more than 1.8 billion people in the tropics and subtropical region infecting about 100 million people every year.[2] According to World Health Organization (WHO), Dengue is the fastest spreading tropical disease and represents a pandemic threat.[3] Challenges remain in understanding the basic mechanism of viral replication and disease pathogenesis, in clinical management of patients and in control of dengue viral transmissions. Owing to lack of any diagnostic marker and any specific clinical symptoms to identify cases that will have a severe disease outcome, early diagnosis and close monitoring with symptomatic treatment is necessary.[4] Therefore In the present study we report the seroprevalence of dengue infection among patients attending Dr.M.K.Shah Medical college and research center and smt. S.M.S. multispeciality hospital Ahmadabad, Gujarat.

Material and Method

Study duration and Sample size: A retrospective study was performed at the Department of Microbiology, Dr.M.K.Shah Medical college and research center and smt. S.M.S. multispeciality hospital Ahmedabad, Gujarat from July 2017 to October 2017. A total of 611 serum samples from suspected dengue cases attending OPD or admitted in the wards of Smt SMS multispeciality hospital were tested for the confirmation of Dengue. Cases included are adults as well as pediatric patients and the age group varied from one year to eighty years. A suspected case of dengue was considered a patient with signs and symptoms like headache, retro-orbital pain, myalgia, arthralgia, rash and haemorrhagic manifestation, etc.[7,8]

Materials and Methods

Serum samples from these patients were tested for Dengue NS1 antigen using dengue NS1 antigen capture ELISA (PanBio Diagnostics) and dengue IgM antibody by dengue IgM capture ELISA (PanBio Diagnostics) for the

*Corresponding Author: Kinal Shah, Dept. of Microbiology, Dr. M. K. Shah Medical College & Research Center, Ahmedabad, Gujarat, India
Email: kinalshah103@gmail.com
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confirmation of dengue cases. ELISA tests were performed as per the manufacturer's instructions.

We have received blood samples in our microbiology laboratory, the blood samples were allowed to clot at room temperature and then we centrifuged the samples and serum samples were separated. From the serum samples we have done NS1 Ag and IgM Ab testing by ELISA.

Ethical clearance

Consent of the Institutional Ethical Committee was taken for the study.

Results

We have tested 611 serum samples for dengue infection during the study period in our hospital. Out of which 104(17%) serum samples were positive for dengue infection. 77 serum samples were positive for Dengue NS1 antigen ELISA and 27 serum samples were positive for Dengue IgM ELISA.

Table 1: Distribution of dengue by Age

Age in year	Total cases	Dengue positive cases		Total positive percentage (%)
		NS1Ag	IgM Ab	
< 14	14	1	0	0.9
14 – 25	269	51	16	64.5
26 – 60	310	23	11	32.7
61 – 80	18	2	0	1.9

Table 1 Shows age wise distribution of dengue infection. Majority of samples were tested positive in age group 14-25 year (64.5%) and 26-60 year (32.7%). Age group <14 years and age group 61-80 years shows less prevalence (0.9% and 1.9% respectively).

Table 2: Distribution of dengue by gender

Gender	Total cases	Dengue positive cases		Total positive percentage (%)
		NS1 Ag	IgM Ab	
Male	385	64	22	82.7
Female	226	13	5	17.3

Table 2 Shows gender wise distribution of dengue infection. It shows prevalence of dengue infection is more in male (82.7%) than female (17.3%).

Discussion

Dengue is prevalent throughout India in most of the urban cities/towns affecting almost 31 states / union territories. Maximum cases have been reported from Kerala, Tamilnadu, Karnataka, Orissa, Delhi, Maharashtra and Gujarat. All four dengue serotypes have been isolated from India. Serotype prevalence varies between seasons, but DEN-1 and DEN-2 are widespread.[1]

NS1 antigen becomes detectable from day 1 of fever and remains positive up to 18 days. IgM antibody appears first after 5 days of fever and disappears within 90 days.[1] Early detection of dengue by using NS1 antigen ELISA will be helpful for better outcome of patient suffering from dengue viral infection because there is no specific antiviral therapy. Treatment is symptomatic and supportive. While currently the vaccine is approved in Mexico, Philippines, Brazil, Indonesia, Thailand and Singapore. In India it is not available yet.[1]

Majority of samples were tested positive in age group 14-25 year (64.5%) and 26-60 year (32.7%). The higher prevalence of dengue infection was noted among males (82.7%) than females. High prevalence amongst males is probably due to more outdoor activities by males in comparison to females which results in more exposure to day biting mosquitoes.[5,6] This findings are correlated with other author's study of Patankar M et al and Mistry M et al.

Dengue cases were reported during whole year but cases were increased during monsoon and post monsoon period because aedes mosquito flourishes during rainy seasons but can breed in water filled flower-pots, plastic bags etc. Avoiding mosquitoes is important to avoid contracting dengue fever. Wear full sleeves shirt and pants, use insect repellent, use mosquito netting over the bed if available, spray insecticide at breeding site of mosquito.

Conclusion

The present study reported that dengue infection most commonly seen in males and active adult population. Rapid urbanization in developing countries increases prevalence of dengue. Effective implementation of vector control measures through efforts toward vector breeding source reduction help in reduction of the dengue prevalence in community. This prevention measures will be helpful to us for decreasing other vector borne diseases simultaneously.

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Conflict of Interest

None.

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