Seroprevalence of Dengue at a Tertiary Care Hospital, Vadodara Gujarat

Gopal Koli[1], Kunjal Vaja[2], Govind Ninama[3], Bithika Duttaroy[4]

[1,2,3,4]Department of Microbiology, Medical College Baroda, Vadodara, Gujarat, India

Corresponding author: Dr. Govind Ninama
Conflict of interest: Nil

Abstract

Background: Dengue is one of the most serious mosquito borne viral infection mainly affecting tropical and subtropical countries of the world. In absence of specific treatment and vaccine for dengue fever (DF); vector control is the only method by which the spread of dengue can be prevented.

Aims & Objective: This study was conducted to report the prevalence of Dengue virus infection in Department of Microbiology, Medical College Baroda, Vadodara, Gujarat, India.

Material and Methods: Study was performed at a Department of Microbiology, Medical College Baroda, Vadodara from Jan2022toDec 2022. Patients attending SSGH Hospital & Medical College Baroda, for suspected dengue were tested. Blood samples collected in plain tubes were tested for dengue IgM antibodies and NS1 antigen by Dengue IgM capture enzyme linked immune sorbent assay and Dengue Early ELISA respectively. The laboratory records were analyzed for demographic features and seasonal variations. Descriptive statistics were used. Data were expressed in proportions.

Results: Out of total 8204 serum samples tested, 927 were found positive for dengue virus infection. 60% positive samples were of male patients and 82% positive samples were from 18 to 35 years age group (Adult population). Seasonal trend showed a gradual increase in dengue positives started from August with a peak in October (37%).

Conclusion: Dengue has established its transmission in urban and semi-urban areas of Vadodara, Gujarat with predominantly affecting males and active adult population. Virus activity is high during monsoon and post monsoon period which coincides with increased vector breeding. This study thus emphasizes the need for continuous epidemiological surveillance for the timely formulation and implementation of effective dengue control programme.

Keywords: Dengue; Dengue Early ELISA; IgM Antibody Capture Enzyme Linked Immunosorbent Assay; NS1 antigen; Vector.

Introduction

Dengue is a mosquito-borne viral infection found in tropical and sub-tropical regions around the world. In recent years, transmission has increased predominantly in urban and semi-urban areas and has become a major international public health concern. Dengue is believed to infect 50 to 100 million people worldwide a year with half a million life-threatening infections requiring hospitalization, resulting in approximately 2.5% deaths.[1] In India, a dengue virus infection has been frequently encountered in epidemic proportions in several states.[2-6]

Dengue virus infection produces a spectrum of clinical illness, ranging from an asymptomatic or mild febrile illness to classic dengue fever (DF) to the most severe form of illness, dengue hemorrhagic fever (DHF).[7]There is no specific treatment for dengue/ severe dengue, but early detection and access to proper medical care lowers fatality rates below 1%.[1] As effective control and preventive programmes for dengue infection are based upon improved surveillance data, this study was done to report the prevalence of dengue virus infection at Department of Microbiology, Medical College Baroda, Vadodara from Jan 2022 to Dec 2022. It also intended to detect the epidemiological and clinical profile of dengue infection.

Materials and Methods

This study was undertaken at a Department of Microbiology, Medical College Baroda, Vadodara from Jan 2022 to Dec 2022. Blood samples were received from patients of all age groups (1 month to 95 years) suspected of dengue, DHF and Dengue Shock Syndrome.. Demographic details and clinical history were obtained and recorded in Laboratory Request forms. Sera were separated and preserved at 4^0C till the time of testing. for non-structural 1 (NS1) antigen, while sera of patients with illness more than 5 days were tested by dengue IgM antibody capture ELISA (MAC ELISA) (received from NIV, Pune) for IgM antibody detection as per kit insert.

Results

During the study period, a total of 8204 blood sampleswere tested for dengue. Of the total samples tested, 10.67% (n=876) were found to be positive for dengue virus. From the total positives for dengue, 60% (n=531) were males and 35% (n=345) females. So, it was observed that dengue affected males and females in a ratio of 1.5:1.

During this study, a majority of patients tested for dengue cases were of 18 to 35 yrs age group (82%) followed by the age group 0 to 10 yrs (12%).

A gradual increase in dengue positive cases was noticed from August (16%) with a highest peak in October (37%) followed by November (12%) and September (15%)

As analyzed fever was present in almost all cases followed by myalgia, headache , joint pain , skin rash, abdominal pain and vomiting Hemorrhagic manifestations were present in only few cases.
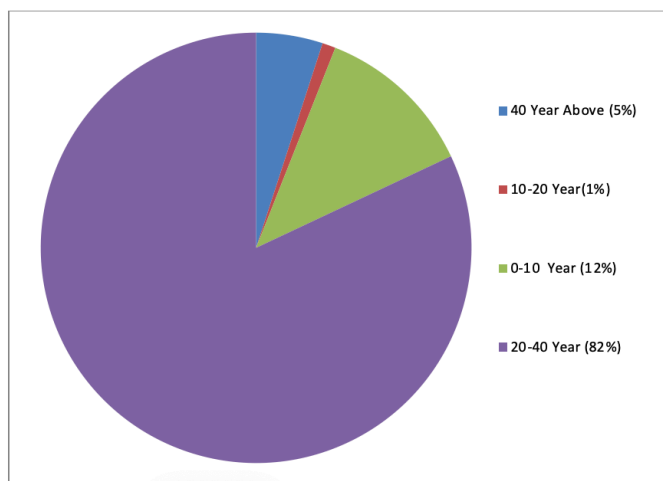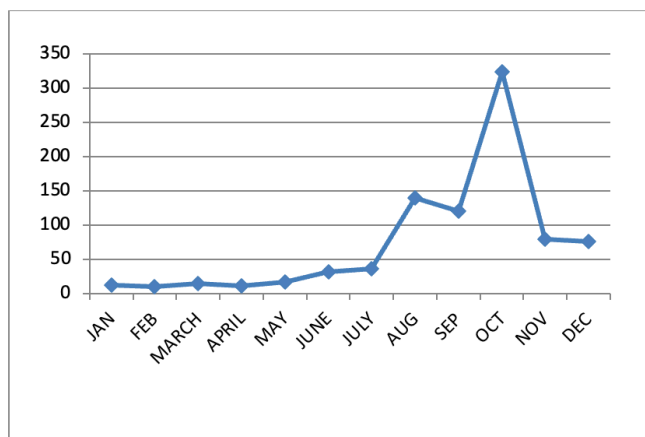

Figure 1: Age Wise Distribution of Dengue cases

Figure 2: Month wise distribution of Dengue cases

Discussion

In this study, 10.67% patients were positive for dengue infection. These findings are in accordance with other studies conducted in India by Garg A[2] and Paramasivan R[5].

The higher prevalence of dengue infection was noted among males than females. The male to female ratio was 1.5:1 which correlates well with other studies undertaken in North India [2,6] and South India[4]. 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. Majority of infection occurred in active adults in the age group of 18 to 35 years. These findings are consistent with other Indian studies.[4,6,8] Active adults are doing more outdoor work so there are more chances for them to get infected. However, in studies conducted in North India [2], in Chennai [9] and in several international studies[10,11], dengue has been reported to mainly a pediatric public health problem. True endemicity will be reached when the adult infection declines and only the new entrants into the population, that is, the

children, are affected more by the disease.

To identify the seasonal variation of the disease, analysis of the data on monthly basis was done. The infection started spreading in August, peaked in October and slowly tapered by December. The seasonality of transmission of dengue with increased activity in monsoon and post monsoon season was seen in the present study; in accordance with the reported patterns of dengue transmission.[6] This seasonal outbreak of disease transmission is very important at local level for effective control measures and that preventive measures should come into full swing during water stagnation periods after the initial bouts of rainfall and at the end of monsoon.

The clinical profile of dengue revealed that fever was the most common presenting symptom. Similar studies in and around India have also reported the same pattern.[4]

Conclusion

Definitive diagnosis is needed to detect early infection and initiate treatment which otherwise may result in life threatening complications. Dengue affected predominantly males and active adult population. A seasonal trend was observed for dengue infections with maximum cases in post monsoon and late monsoon months which coincides with increased breeding of mosquitoes during these seasons. Therefore, vector control measures should be started before monsoon to prevent the outbreaks of dengue. This will simultaneously solve the problem of other mosquito borne diseases like malaria, chikungunya, Japanese encephalitis and filarial

Acknowledgements

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