Medico Research Chronicles

ISSN No. 2394-3971

Original Research Article

A SEROLOGICAL SURVEY OF ANTI-DENGUE ANTIBODY, JAMNAGAR, GUJARAT, INDIA

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Submitted on: March 2015
Accepted on: October 2015
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Abstract:

Introduction: Dengue virus infection, the most important emerging tropical viral disease, is a significant cause of morbidity and mortality in many parts of the world like South-East Asia, Central and South America, and more than 200 countries in all over continents. Epidemic outbreaks of dengue fever have become very frequent in recent year in India.

Material and Method: A serological survey to detect IgM and IgG antibody to dengue virus was carried out on fever patients at Shri M. P. Shah Medical College, Jamangar, Gujarat. Total 245 febrile patients were included in this research.

Result: 45 patients were diagnosed positive for malaria; hence they were not tested for dengue. Rest 200 patients were tested for dengue. 16 patients showed positive titer of anti-dengue IgG antibody, with overall sero-prevalence of anti-dengue IgG at 8%. Out of 16 IgG positive cases, 11 (69%) patients lived in Jamnagar city and 5 (31%) patients belonged to rural areas around Jamnagar. No patient had shown positive titer of anti-dengue IgM antibody.

Conclusion: Overall 8% sero-positivity for anti-dengue IgG antibody may be alarming signal for dengue fever occurrence, although Jamnagar is not a known epidemic zone for dengue virus infection.

Key words: dengue, serological survey

Introduction

Dengue virus infection, the most important emerging tropical viral disease, is a significant cause of morbidity and mortality in many parts of the world like South-East Asia, Central and South America, and more than 200 countries in all over continents. Dengue virus is known to cause three forms of clinical syndrome,

1) Classical Dengue Fever (DF)
2) Dengue Haemorrhagic Fever (DHF)
3) Dengue Shock Syndrome (DSS)

Today, dengue ranks as the most important vector borne disease. It is estimated that

there are 50 to 100 million cases of dengue fever of whom > 1 million need to be hospitalised each year. About 0.5 million cases of dengue haemorrhagic fever each year require hospitalisation.[1]

Four serotypes of dengue virus exist. DEN-1 first isolated from Hawai in 1944, DEN-2 first isolated from New Guinea in 1944, DEN-3 and 4 first isolated from Philippines in 1956.[2]

The various serotypes of the dengue virus are transmitted to humans through the bites of infected *Aedes* mosquitoes, principally *Aedes aegypti*. Dengue outbreaks have also been attributed to *Aedes albopictus*, *Aedes polynesiensis* and several species of the *Aedes scutellaris* complex. Each of these species has a particular ecology, behaviour and geographical distribution.[1]

Epidemic outbreaks of dengue fever have become very frequent in recent year in India. About 50 outbreaks have been reported during the period 1956 to 1996. Between 1970 and 1996, there has been 3-fold increase in the outbreak of the disease.[3]

Material and Method

A serological survey to detect IgM and IgG antibody to dengue virus was carried out on fever patients at Shri M. P. Shah Medical College, Jamangar, Gujarat. Total 245 patients were included in this research. Out of whom, 45 patients were diagnosed positive for malaria, and rest 200 patients were diagnosed negative for malaria. The patients, who have been smear negative for malaria, were screened for Dengue virus infection. Hence, a total of 200 serum samples from malaria negative patients, residing in and around Jamnagar city were screened for Dengue virus infection as under:

1) Detection of IgM antibody: by Dengue IgM ELISA Test for detection of recent dengue infection.
2) Detection of IgG antibody: by Dengue IgG ELISA Test for detection of previous dengue infection.

Result

Total 245 febrile patients were included in this research. Out of whom, 45 patients were diagnosed positive for malaria; hence they were not tested any further for dengue. Rest 200 patients were diagnosed negative for malaria, which were tested for dengue. 155 patients were found from Jamnagar city and 45 were found from villages around Jamnagar city. Total 16 patients showed positive titer of anti-dengue IgG antibody, with overall sero-prevalence of anti-dengue IgG at 8%. Out of 16 IgG positive cases, 11 (69%) patients lived in Jamnagar city and 5 (31%) patients belonged to rural areas around Jamnagar. But none had shown positive titer of anti-dengue IgM antibody.

Out of total 16 cases, 9 (55%) were females and 7 (45%) were males. Out of total cases, male and female had shown positive level of anti-dengue IgG antibody, 3.5% and 4.5% respectively.

The highest sero-positivity to anti-dengue IgG antibody (5, 31.25%) was seen in the age group of 20-29 years. The age group of 10-19 (4) showed sero-positivity at 25%, and age group 30-39 (3) showed sero-positivity at 19%.

Discussion

In India, epidemic DHF has expanded geographically from south-east to west part of nation. Epidemic outbreaks of dengue fever have become very frequent in recent years. About 50 outbreaks have been reported during the period 1956 to 1996. Between 1970 and 1996, there has been a three-fold rise in the outbreak at the disease. In one study covering 100 villages of Nadiad (District: Kheda) in Gujarat showed the presence of *Aedes aegypti* mosquito in all villages under study. [3]

Compared to our anti-dengue IgG Antibody at 8%, Yap state USA showed 93% of the

same in 1995. This very high sero-prevalence of anti-dengue IgG antibody was seen because the survey in the Yap state conducted just after a few days of epidemic, where wide spread exposure to dengue virus, was obvious.[4]

Switzerland (1993-94) and Sao Paulo, Brazil (1992) showed sero-prevalence of anti-dengue IgG antibody as 10% and 5.4% respectively.[5,6,7]

Santa clara, Peru (1999) and Amazon Region, Peru (1994) showed sero-prevalence of 294% and Columbia, USA showed 20%. These places are known epidemic zones and presence of vector mosquitoes has been proved in these areas.[8,9,10]

A study done in Ahmedabad, Gujarat (1996) and Switzerland (1995) showed sero-prevalence of anti-dengue IgG antibody at 2% and 8% respectively.[5,11]

Present study shows positive rate of 11.1% of anti-dengue IgG antibody in villages around Jamnagar city which indicates circulation of dengue virus in different villages around the city of Jamnagar. This could be because of breeding sites for vector mosquitoes, overcrowding in lower socio-economic class, poor hygiene. No anti-dengue IgM antibodies were found, from which it can be concluded that there was no recent infection of dengue virus in these places.

Conclusion

The studies done on dengue fever and dengue haemorrhagic fever have proved that transmission of this disease takes place silently because of low infectivity and low potency of the dengue virus primarily, which results in subclinical infection. The infection spreads slowly and covers more and more geographical area. After significant period of time virus gains high infectivity and high potency which results in epidemic attacks. Overall 8% sero-positivity for anti-dengue IgG antibody may be alarming signal for dengue fever occurrence, although Jamnagar is not a known epidemic zone for dengue virus infection.

Acknowledgement

The authors are grateful to the hospital staff of Shri M. P. Shah Medical College, Jamangar, Gujarat.

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