ORIGINAL ARTICLE

SEROPREVALENCE OF DENGUE IN KOTA, RAJASTHAN: A STUDY AT A TERTIARY CARE HOSPITAL
Deepak Maheshwari¹, Divya Dadhich², Naveen Saxena³

HOW TO CITE THIS ARTICLE:

ABSTRACT: Introduction: Dengue is a most significant febrile illness caused by a single stranded enveloped RNA virus belongs to the family Flaviviridae, genus Flavivirus. Dengue infection is caused by any one of four distinctive antigenically related dengue virus serotypes: DENV-1, DENV-2, DENV-3 and DENV-4. In India, a dengue virus infection has been frequently encountered in epidemic proportions in several states. There is no specific treatment for dengue/ severe dengue, but early detection and access to proper medical care lowers fatality rates below 1%. MATERIALS AND METHODS: This study was undertaken at a tertiary care teaching hospital at Kota from January 2013 to December 2013. Blood samples were received from patients of all age group suspected of dengue, DHF and Dengue Shock Syndrome. Sera were separated and preserved at 4°C till the time of testing. Sera were tested by dengue IgM antibody capture ELISA (MAC ELISA) (received from NIV, Pune) for IgM antibody detection as per kit insert. RESULT: During the study period, a total of 13077 blood samples were tested for dengue. Of all the patients tested, 9066 were males and 4011 were females. Dengue affected males and females in a ratio of 3.7:1. During this study, out of the total positive for dengue, positivity was highest (n=566, 31.65%) in the adult age group of >30 yrs followed by the age group of 15 to 30 yrs (n=408, 22.8%). DISCUSSION: Dengue is an important emerging disease of the tropical and subtropical regions today. Epidemics of dengue are increasing in frequency. The prevalence of dengue seropositivity among clinically suspected cases during the study period was 13.67%. Our study results call attention to the need for continuous surveillance and individual and community action for dengue control.

KEYWORDS: Dengue, dengue hemorrhagic fever, IgM antibody capture ELISA.

INTRODUCTION: Dengue is a most significant febrile illness caused by a single stranded enveloped RNA virus belongs to the family Flaviviridae, genus Flavivirus.(1) Dengue infection is caused by any one of four distinctive antigenically related dengue virus serotypes: DENV-1, DENV-2, DENV-3 and DENV-4.(2)

Medical manifestations of dengue infection range from asymptomatic, to mild flu-like symptoms, to severe life-threatening dengue complications such as dengue shock syndrome (DSS) and dengue hemorrhagic fever (DHF).(3) The dengue virus is transmitted to humans through the bite of an infected mosquito of the genus Aedes (Namely Aedes aegypti and Aedes albopictus) during daylight hours.(4) Both viral and host factors are thought to contribute to the manifestations of the disease in each infected person.(5)

The incidence of dengue has grown dramatically around the world in recent decades. Over 2.5 billion people – over 40% of the world’s population are now at risk from dengue. WHO currently estimates there may be 50–100 million dengue infections worldwide every year.(6) In India, a dengue virus infection has been frequently encountered in epidemic proportions in several states.(7–10)
is no specific treatment for dengue/ severe dengue, but early detection and access to proper medical care lowers fatality rates below 1%.\(^{(6)}\)  

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 Kota, Rajasthan.

**MATERIALS AND METHODS:** This study was undertaken at a tertiary care teaching hospital at Kota from January 2013 to December 2013. Blood samples were received from patients of all age group suspected of dengue, DHF and Dengue Shock Syndrome.

Sera were separated and preserved at 4°C till the time of testing. Sera were tested by dengue IgM antibody capture ELISA (MAC ELISA) (received from NIV, Pune) for IgM antibody detection as per kit insert.

**RESULT:**

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>9066</td>
<td>69.3</td>
</tr>
<tr>
<td>Female</td>
<td>4011</td>
<td>30.7</td>
</tr>
<tr>
<td>Total</td>
<td>13077</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 1: Gender distribution of patients

<table>
<thead>
<tr>
<th>Gender</th>
<th>Dengue IgM</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive (%)</td>
<td>Negative (%)</td>
</tr>
<tr>
<td>Male</td>
<td>1407 (10.76)</td>
<td>7659 (58.57)</td>
</tr>
<tr>
<td>Female</td>
<td>381 (2.91)</td>
<td>3630 (27.80)</td>
</tr>
<tr>
<td>Total</td>
<td>1788 (13.67)</td>
<td>11289 (86.33)</td>
</tr>
</tbody>
</table>

Table 2: Seroprevalence of Dengue IgM antibodies

<table>
<thead>
<tr>
<th>Gender</th>
<th>Dengue IgM Positive</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>1407</td>
<td>78.7</td>
</tr>
<tr>
<td>Female</td>
<td>381</td>
<td>21.3</td>
</tr>
<tr>
<td>Total</td>
<td>1788</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 3: Gender wise distribution of Dengue positive cases

<table>
<thead>
<tr>
<th>Age group</th>
<th>Male (%)</th>
<th>Female (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-23 months</td>
<td>40 (2.23)</td>
<td>53 (2.97)</td>
<td>93 (5.20)</td>
</tr>
<tr>
<td>2-4 years</td>
<td>109 (6.09)</td>
<td>27 (1.51)</td>
<td>136 (7.60)</td>
</tr>
<tr>
<td>59 years</td>
<td>178 (9.95)</td>
<td>43 (2.40)</td>
<td>221 (12.35)</td>
</tr>
<tr>
<td>10-14 years</td>
<td>106 (5.92)</td>
<td>74 (4.13)</td>
<td>180 (10.05)</td>
</tr>
<tr>
<td>15-30 years</td>
<td>408 (22.81)</td>
<td>56 (3.13)</td>
<td>464 (25.25)</td>
</tr>
<tr>
<td>&gt;30 years</td>
<td>566 (31.65)</td>
<td>128 (7.15)</td>
<td>694 (38.81)</td>
</tr>
<tr>
<td>Total</td>
<td>1407 (78.69)</td>
<td>381 (21.31)</td>
<td>1788 (100)</td>
</tr>
</tbody>
</table>

Table 4: Age and sex wise distribution of Dengue positive cases
During the study period, a total of 13077 blood samples were tested for dengue. Of all the patients tested, 9066 were males and 4011 were females [Table 1]. Of the total samples tested, 13.67% (n=1788) were found to be positive for dengue virus [Table 2]. From the total positives for dengue, 78.7% (n=1407) were males and 21.3% (n=381) females. So, it was observed that dengue affected males and females in a ratio of 3.7:1 [Table 3].

During this study, out of the total positive for dengue, positivity was highest (n=566, 31.65%) in the adult age group of >30 yrs followed by the age group of 15 to 30 yrs (n=408, 22.8%) [Table 4].

In the study population, highest numbers of patients were tested for dengue in the month of October 2013 (n=4952) followed by November 2013 (n=3083) and September 2013 (n=2648). A gradual increase in dengue positive cases was noticed from july 2013 (n=30) with a highest peak in October (n=715) followed by November (n=431) and September (n=426) [Graph 1].

DISCUSSION: Dengue is an important emerging disease of the tropical and subtropical regions today. Dengue infection has been known to be endemic in many parts of India for over two centuries as a benign and self-limited disease. Epidemics of dengue are increasing in frequency. Detection of all four dengue serotypes in India has now rendered the India hyperendemic.\(^{(11)}\)

The present study focused the status of dengue fever cases in Kota (Rajasthan). The prevalence of dengue seropositivity among clinically suspected cases during the study period was 13.67% which is lower than the study done by saini et al (30.6%).\(^{(12)}\) The male to female ratio in present study was 3.7:1 showing male predominance as reported by various authors.\(^{(12–14)}\) The study revealed the most affected age group was (>30 year) followed by (15-30yr) which is comparable to Saini et al\(^{(12)}\) and Kumar et al.\(^{(15)}\) Some authors reported the vulnerability of children to dengue infection.\(^{(16,17)}\) The transmission of dengue infection increases in post monsoon period as was also observed in the study. The presence of stagnant water after rain fall favors the mosquito breeding which leads in an increased occurrence of dengue.\(^{(18-20)}\)
Our study results call attention to the need for continuous surveillance and individual and community action for dengue control.

REFERENCES:
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12. Saini S, Kinikar AG, Deorukhkar S, Bhalerao D, Roushani SB. Epidemiology and seropositivity of dengue fever cases in a rural tertiary care hospital of western Maharashtra, India * Correspondence Info : 3809 (2013).


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