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Original Research Paper

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STUDY ON PREVALENCE OF DENGUE FEVER IN A TERTIARY CARE HOSPITAL, SOUTH INDIA

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ABSTRACT

BACKGROUND: Dengue is an acute febrile arboviral illness affecting the tropical and sub tropical regions of the world. It is one of the most important causes of morbidity and mortality in India. This study was done to find out the prevalence of dengue virus infection and its serotype in and around Theni District.

METHODS: The study was conducted at Government Theni Medical College (GTMC), Theni, during January 2015 to July 2017. Patients with symptoms of dengue fever attending GTMC hospital were included for the study. Serum samples were tested for dengue NS1 antigen and IgM antibodies by ELISA. Out of 1292 samples, 989 were tested for IgM and 303 were tested for NS1 antigen detection. The NS1 positive samples were further subjected to Real Time PCR for the identification of dengue serotypes.

Results: Dengue infection was confirmed in 520 (40.25%) cases which include 383 IgM positives and 137 NS1 positives. Paediatric patients were found to be the predominant 390 (75%)] propotion among the dengue cases, whereas adults accounts for only 130(25%)., Circulation of all four dengue serotypes were detected in our region with predominance of serotype 1.

Conclusion: Dengue infection in our region is documented throughout the year which requires the strengthening of mosquito control program to contain the risk of epidemic during rainy season.

KEYWORDS : Dengue virus, prevalent serotype, ELISA

Introduction:

Dengue has become a major health problem causing significant morbidity and mortality, and also considerable economic loss due to illness among productive population especially in developing countries. Across the globe, around 2.5 billion people live in dengue prone areas (1). According to earlier reports all serotypes are prevalent in India(2). Recently dengue has become the leading cause of vector borne disease in Tamil Nadu.

Materials and methods:

Study participants were patients with fever visiting Government Theni Medical College Hospital (GTMC) from Jan 2015- July 2017, whose serum samples were referred to Virus Research and Diagnostic Laboratory (VRDL), GTMC, Theni for dengue diagnosis. Case definition and diagnosis were done as per the World Health Organization (WHO) guidelines (3). Most of the samples were collected within 2 to 11 days from the onset of fever and sent to VRDL on the same day. Samples were tested for acute phase dengue infection by Dengue NS1 ELISA (Panbio Ltd, Bloomberg, Australia) or dengue specific IgM by MAC ELISA (NIV, Pune, India). Further, the NS1 positive samples were subjected to RNA isolation by QIAamp® Viral RNA Mini Kit (Qiagen, Germany) and serotyping was done by CDC DENV-1-4 multiplex Real-Time RT-PCR kit .The preparation of reagents and the cycling conditions were followed as per the manufacturer's instructions.

Results

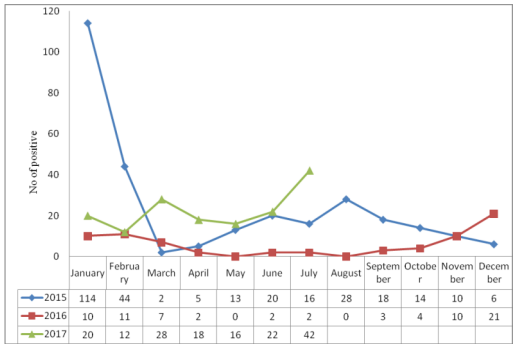
During the study period a total of 1292 patients were tested for dengue infection . among them 520(40.25%) were positive Of this IgM was positive in 73.65% and NS1 was positive in 26.35%.Notably the incidence t was higher in 2015 .

Table: 1 Year wise distribution of suspected IgM positive and NS1 positive cases (2015-2017):

YEAR	SAMPLES TESTED	IgM		Ns1		TOTAL(IGM and NS1) POSITIVE
		TESTED	POSITIVE	TESTED	POSITIVE	
2015	676	580	212	96	78	290
2016	237	150	55	87	17	72
2017*	379	259	116	120	42	158
Total	**1292**	**989**	**383**	**303**	**137**	**520**

***Till July2017.**

Figure 1: Monthly distribution of cases over a period of three years (2015-2017):



Month wise distribution of cases.

The dengue positive statics were plotted on a monthly graph to detect any seasonal variation in the incidence of dengue. In our study dengue infection was reported throughout the year and an increased disease burden was noted between July and September in all the three years.

Sex wise distribution of cases

Of the 1292 cases tested (968 males, 625 females), the IgM positivity was 276 (53.076%) in males and 244 (46.923 %) in females.(Figure2)

Sex wise distribution of dengue IGM /NS1 positive cases :

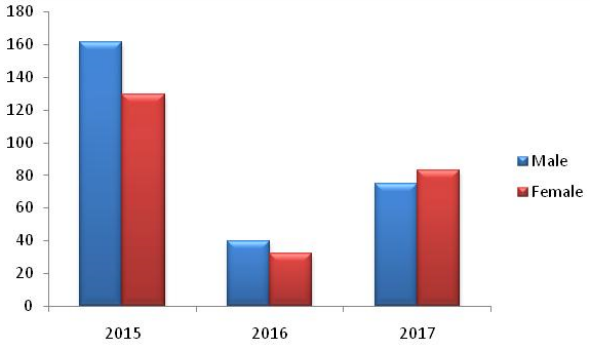


Table:2 Paediatric Vs Adult distribution of cases:

YEAR	ADULT	PAEDIATRIC
2015	71	219
2016	19	53
2017	40	118
TOTAL	130	390

Table 2 shows about 75% of total cases were pediatric patients ($P<0.05\%$) .The median age of the study participants were (19 ± 17 yr). (Range 0-89 yr)

Table:3 Serotype prevalence of Dengue:

Year	Serotype 1	Serotype 2	Serotype3	Serotype 4
2015	13	2	0	0
2016	0	0	1	0
2017	13	1	1	1

Molecular studies on the circulating serotypes revealed that this district is endemic for all four dengue serotypes. Dengue serotype 1 is the predominant serotype during the overall study period. Only one case of Dengue serotype 4 was documented during the study period.

Discussion:

Over the last two decades dengue out breaks has been reported in different parts of the country.The first report from India on dengue virus serotype 1 and 4 was reported in the year 1964 and serotype 3 in 1996(4,5). There after all serotypes have been reported from different parts of the country (6,7,8). Our study reveals children in Theni District are vulnerable to develop dengue fever. This has to be taken into serious consideration as previous findings showed that children in Asian countries exhibit high risk for DHF (Kittigul et al., 2007; Carlos et al., 2005 and Nguyen et al., 2004)(9,10,11). The increased susceptibility of children to dengue infection is reestablished in our study, as reported earlier by Cherian et al., 1994.(12).

In our study dengue sero positivity is reported throughout the year Interestingly, the month of July 2017 shows high positivity (42 cases) compared to earlier years.. This alarming data indicated that there may be further increase in the cases as July is the gateway for the yearly monsoon.(13) Molecular studies on the circulating serotypes revealed that this district is endemic for all four dengue serotypes with the with the overall predominance of DENV-1.

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