

**EPIDEMIOLOGY OF DENGUE FEVER IN SRIKAKULAM DISTRICT, ANDHRA PRADESH**B. Arunasree<sup>1</sup>, Prasad Uma<sup>2</sup>, B. Rajsekhar<sup>3</sup>**HOW TO CITE THIS ARTICLE:**

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**ABSTRACT: BACKGROUND:** Dengue fever is one of the most important Arboviral diseases in man with outbreaks in India and South East Asia. Published data regarding the prevalence of dengue fever in coastal Andhra Pradesh is not available. We report a prospective analysis of dengue positive cases referred from various primary health centres of rural, tribal and semiurban areas of Srikakulam district, Andhra Pradesh. **AIMS OF STUDY:** To analyse the burden of Dengue fever in the Srikakulam district of Andhra Pradesh. **MATERIAL AND METHODS:** A prospective descriptive study was undertaken between January-2013 to December-2014 by testing clinically suspected primary Dengue patients attending tertiary care centre in the Srikakulam District, Andhra Pradesh. Blood samples were collected from patients with dengue fever like febrile illness attending the Pediatric and Medicine clinics. The sera collected from suspected patients were analysed for Dengue specific IgM antibody by IgM antibody capture enzyme linked immunosorbent assay (ELISA) using NIV kit. The data was analysed. **RESULTS:** During the study period the total number of samples screened with clinical suspicion of dengue fever was 695, out of which 97 (13.95%) were positive for IgM antibodies. The IgM positivity was 54 (55.67%) in males and 43 (44.3%) in females. Of the 97 reactive cases, 41 (42.26%) were positive paediatric cases (<14 yrs) and 56 (57.73%) were adults. The number of seropositive cases referred from rural and tribal areas was 54 (55.67%). The percentage of IgM positive dengue fever was found to be high during the months of September. **CONCLUSION:** The number of seropositive dengue fever was more in the months of monsoon indicating that vulnerability to dengue infection is more during this period. Efforts have to be made through community awareness and early institution of therapy. Vector control measures should be in full swing at the very onset of monsoon.

**KEYWORDS:** Dengue fever, IgM positivity, Srikakulam district.

**INTRODUCTION:** Dengue fever (DF) is a vector borne disease caused by four closely related Dengue viruses (DENV-1-4) Dengue fever is commonly distributed in most tropical and sub-tropical areas where *Aedes aegypti* and /or *A. albopictus* are abundant. Dengue leads to considerable disease burden morbidity, mortality especially in the tropics, with more than 2/5<sup>th</sup> of the world's population living in areas at risk for Dengue. From being a sporadic illness, epidemics of dengue have now become a regular occurrence worldwide.<sup>[1,2]</sup>

Dengue fever has been recognized for many years in India since the outbreak of Dengue in 1912 in Kolkata.<sup>[3]</sup> In south India all the four serotypes of Dengue virus were first isolated from febrile patients in Vellore, Tamil Nadu between 1956 and 1966. However until 1990 no major outbreak of Dengue fever/Dengue hemorrhagic fever was reported in Tamil Nadu.<sup>[4]</sup> One of the largest outbreaks in North India occurred in Delhi and adjoining areas in 1996, which was mainly due to Dengue-2 virus. Thereafter in 2003, another outbreak occurred in Delhi and all four Dengue virus serotypes were found to be co-circulating.<sup>[5]</sup>

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In the recent years DF/DHF out breaks were reported in Chennai, Krishnagiri and Dharmapuri district, in 2001. From 2004 to 2005 there has been an increase in the number of Dengue reporting units. Present study was carried out to determine the epidemiological determinants of dengue cases referred to tertiary care centre from various primary health centres both rural and tribal area in Srikakulam district, Andhra Pradesh, which would help in rendering adequate preventive measures to control the disease.

**MATERIAL AND METHODS:** A prospective descriptive study was under taken between January-2013 to December-2014 by testing clinically suspected primary Dengue patients attending tertiary care centre in the Srikakulam District, Andhra Pradesh. This centre receives samples from semiurban, rural and tribal areas from Srikakulam district.

Blood samples were collected from patients with Dengue fever (DF) like febrile illness attending the Pediatric and Medicine clinics. The patients were diagnosed as having DF based on standard criteria; presentation with febrile illness of 2 to 7 days duration with features like headache, myalgia arthralgia, rash, hemorrhagic manifestations, thrombocytopenia and leucopenia. The exact date of sampling was not available for most of the patients. Approximately 3 ml of blood was collected, serum was separated. The sera collected from suspected patients were analysed for Dengue specific IgM antibody by IgM antibody capture enzyme linked immunosorbent assay (ELISA) using NIV kit. The data was analysed.

**RESULTS:** During the study period, the total number of samples screened was 695 of which 97 (13.95%) were positive for IgM antibodies (Table 1 & 2). There was decrease in the percentage positivity in 2014 when compared to 2013 ( $P < 0.05$ ).

Of the 695 cases screened, 294 (42.30%) were paediatric cases and 401 (57.69%) were adults. Of the 97 reactive cases, 41 (42.26%) were positive paediatric cases (<14 yrs) and 56 (57.73%) were adults. The IgM positivity was 54 (55.67%) in males and 43 (44.3%) in females. The samples were collected among the age group of 0-70 years and the distribution of seropositive cases in adults was uniform in the age group ranging from 19 years to 62 years. Among the paediatric age group, positivity was higher in 1-5 and 6-12 yrs age group. (Table 3 & 4).

The observed dengue IgM seropositivity month wise is illustrated for the year 2013 and 2014. The percentage of IgM positivity was found to be high during the months of September in all the two years. (Table 1 & 2). The observed dengue IgM seropositivity percentage showed an increase with increase in the monthly rainfall. There was an increased seropositivity during the cooler months. The number of seropositive cases referred from rural and tribal areas was more 54 (55.67%).

**DISCUSSION:** Dengue occurs globally in tropical and subtropical regions where mosquito species which are vectors of the disease are found. At least 2.5 billion people, two fifths of World' population is at risk of dengue virus infection and the number of infections worldwide may reach 50 million cases annually. Present study was carried out to determine the epidemiological determinants of dengue cases referred to the tertiary care centre from various primary health centres both rural and tribal area in the Srikakulam district, Andhra Pradesh.

Hitesh Bhabhor et al<sup>[6]</sup> from Ahmadabad analyzed 797 patients with clinical suspicion of dengue fever. His observations were, the prevalence of dengue fever cases was more during the month of October (27.60%), age group which was most affected was between 15-24 years (41.65%),

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males were more affected than females(64.24%) and 95.48% got cured without any complications. Ashwini Kumar et al<sup>[7]</sup> from Udipi district, Karnataka recorded 19.1% of cases in the month of September with 57.3% of cases occurring during 15-44 years of age. Jamaiah et al<sup>[8]</sup> from Kuala Lumpur Malaysia recorded 22% of cases in the month of January.

P. Gunasekha et al<sup>[9]</sup> from Chennai analyzed 968 cases with 84% of pediatric cases being < 14 years and 15.5% being adults. IgM positivity was seen in 43.1% of cases with 36.7% being in males and 52.8% being females. The prevalence of dengue fever was more common in females. Noticeable increase in occurrence of cases was seen during cooler months i.e during monsoon and post monsoon months. In a study conducted in Delhi,<sup>[10]</sup> 21-30 years age group was most commonly affected and another study conducted in Kanpur,<sup>[11]</sup> showed 0-15 year's age group to be commonly affected.

Sanghamitra Padhi et al<sup>[12]</sup> of Southern Odisha tested 5102 samples, 1074(21.05%) were positive for dengue IgM antibodies. Majority 47.86% of cases were detected in the month of September indicating an active viral transmission during monsoon and post monsoon period. The most common affected age group was between 11-20 years followed by 21-30 years. Seasonal trend in each year showed that there were almost no positive cases from January to June, the infection started spreading in August, reaching its peak in September and October and slowly declined in December. IgM seropositivity was more among females (21.2%), while 20.9% in males.

In the present study the prevalence of seropositive dengue fever cases showed gradual rise from the month of March (7.2%), May (10.30%), June (16.49%), August (17.52%) to September (30.72%) followed by decrease in prevalence of cases from October (5.15%). No cases were recorded in the month of February, establishing the fact that active viral transmission occurs during monsoon and post monsoon months as observed in other studies. However in the present study significant proportion of cases occurred in other months reflecting the fact that anti mosquito measures were not properly implemented. Out of 695 cases with clinical symptoms of dengue fever, dengue IgM positivity was seen in 13.95% of cases which is significant (P value <.05) indicates active dengue virus activity. Males were more affected (55.67%). Age group most commonly affected was 19-48 years (39.1%) and children between 1-12 years (31.95%).

**CONCLUSION:** Transmission of dengue fever increases in monsoon. This shows that the presence of stagnating water after rainfall favours breeding of the mosquito vector resulting in an increasing incidence of dengue fever. These findings also indicate that vulnerability to dengue infection is more during this period. Efforts have to be made through community awareness and early institution of therapy. Vector control measures should be in full swing at the very onset of monsoon.

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Months	Clinically suspected cases of Dengue fever	IgM positive Cases	IgM Negative Cases
January	10	0	10
February	No. Cases	No. Cases	No. Cases
March	57	6	51
April	8	0	8
May	22	9	13
June	65	15	50
July	30	6	24
August	110	13	97
September	114	24	90
October	44	5	39
November	42	3	39
December	24	1	23
<b>Total</b>	<b>526</b>	<b>82</b>	<b>444</b>

**Table 1: Distribution of cases month wise in the year-2013**

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Months	Clinically suspected cases of Dengue fever	IgM positive Cases	IgM Negative Cases
January	3	0	3
February	3	0	3
March	4	1	3
April	2	1	1
May	6	1	5
June	26	1	25
July	14	1	13
August	38	4	34
September	57	6	51
October	No. Cases	No. Cases	No. Cases
November	No. Cases	No. Cases	No. Cases
December	16	0	16
<b>Total</b>	<b>169</b>	<b>15</b>	<b>154</b>

Table 2: Distribution of cases month wise in the year-2014

Gender	No. of Cases	<1 Year	1-5 Years	16-12 Years	13-18 Years
Male	24	1	8	9	6
Female	17	1	5	9	2
<b>Total</b>	<b>41</b>	<b>2</b>	<b>13</b>	<b>18</b>	<b>8</b>

Table 3: Age wise and sex wise distribution of IgM positive cases in children

Gender	No. of Cases	19-28 Years	29-38 Years	39-48 Years	49-58 Years	>58 Years
Male	30	7	8	2	3	10
Female	26	5	7	9	5	0
<b>Total</b>	<b>56</b>	<b>12</b>	<b>15</b>	<b>11</b>	<b>8</b>	<b>10</b>

Table 4: Age wise and sex wise distribution of IgM positive cases in adults

Habitat	No. of IgM +ve cases		Total Cases	Percentage
	2013	2014		
Rural & Tribal	47	7	54	55.67%
Semi urban	35	8	43	44.32%
<b>Total</b>	<b>82</b>	<b>15</b>	<b>97</b>	

Table 5: Distribution of IgM positive cases as per habitat

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