



Prevalence of dengue fever and dengue hemorrhagic fever in government general hospital tirupati

Basavaraju Janardhana Raju¹, Gandikota Rajaram¹

¹Assistant Professor of Microbiology, SV Medical College, Tirupati, AP.

Abstract:

Dengue fever and dengue hemorrhagic fever have been known to be endemic and reportable diseases in India since 1997. The present study was conducted in the Department of Microbiology, S.V. Medical College, Tirupati from August 2007 to July 2008. Most of the cases reported were from the young age groups. These were people who were active outdoors, whether working, schooling or playing outside their homes. The most common clinical presentation was fever.

Key-words: Aedes, Dengue haemorrhagic fever, Dengue virus, Immunopathology

Introduction:

Dengue fever is an important arthropod (mosquito) borne viral disease of tropics and subtropics affecting urban and periurban areas. It is a self limiting disease transmitted by bite of an infected female Aedes mosquito [1].

Dengue virus belongs to Arbovirus group, Family Flaviviridae, Genus Flavivirus and Species Dengue virus. Dengue fever is characterized by fever, headache, myalgia, arthralgia, rash, nausea and vomiting affecting mainly younger age group. The presentation of dengue fever varies from asymptomatic to symptomatic. In symptomatic patients it presents as classical dengue fever, dengue hemorrhagic fever or dengue shock syndrome [2].

Over the past two decades, there has been global increase in the frequency of dengue fever, dengue hemorrhagic fever and its epidemics, with a concomitant increase in disease incidence. Various factors responsible for resurgence of dengue epidemic are; (i) unprecedented human population growth; (ii) unplanned and uncontrolled urbanization; (iii) inadequate waste management; (iv) water supply mismanagement; (v) increased distribution and density of vector mosquitoes; (vi) lack of effective mosquito control has increased movement & spread of dengue viruses and development of hyper endemicity and (vii) deterioration in public health infrastructure [3].

Objective:

To know the prevalence of Dengue Fever and Dengue Hemorrhagic Fever in cases presenting with Clinical features suggestive of Dengue at S.V.R.R.Govt .General Hospital, Tirupati.

Material and Methods:

The present study was conducted in the Department of Microbiology, S.V. Medical College, Tirupati from August 2007 to July 2008. A total of 200 blood samples were collected from patients admitted in S.V.R.R.G.G.H with clinical features suggestive of Dengue fever were screened. The serum samples were tested for IgM antibodies for dengue virus by dengue IgM capture ELISA (Panbio pvt Ltd, Australia). Collection of blood sample: The blood sample was obtained from the patient by venipuncture following strict aseptic precautions and allowed to clot at room temperature and then centrifuged. The serum was separated. Storage of serum sample: Serum sample was refrigerated (2-8°C) or stored frozen in a deep freezer (-20°C), if not tested within two days. Ethical approval: Institutional ethical approval.

Results:

A total of 200 patients admitted in the S.V.R.R Government General Hospital, Tirupati with the symptoms suggestive of Dengue fever were included in the present study. All the patients' serum samples were tested for dengue IgM antibodies by IgM capture ELISA

(PanBio, Australia). This test is a solid phase immunoassay, based on an immunocapture principle.

Table 1: Age-wise and Sex-wise distribution of cases:

Age	Males	Females	Total
0-10	99	64	163
11-20	18	10	28
21-30	2	0	2
31-40	1	1	2
41-50	0	1	1
51-60	1	2	3
61-70	0	1	1
Total	121	79	200

There were 200 patients tested for dengue, 121 were males, and 79 were females and most of the cases were of the 0-10 age group (Table: 1). Most of the cases reported were from the young age groups. These were people who were active outdoors, whether working, schooling or playing outside their homes.

Table 2: Male and Female distribution with positivity

Sex	Total	No of IgM Positive samples
Males	121	49 (40.5%)
Females	79	26 (32.9%)
Total	200	75 (37.5%)

All the 200 cases were tested for IgM antibodies to Dengue virus by IgM capture ELISA. Of the 200 samples tested, 75 samples are positive for IgM antibodies to Dengue. More number of positive cases were observed among the males (Table: 2).

Of the total 99 cases (male) of the age group 0 – 10 thirty nine cases were IgM positive for dengue. Of the total 64 female cases of the age group 0-10 twenty two cases were positive for dengue IgM. Of the 18 male cases from the age group 11-20 years ten were positive for dengue IgM. Similarly of the nine female cases of the same age group three were found to be positive for dengue IgM (Table: 3).

Table 3: IgM Positivity: Age-wise and sex-wise distribution

Age (in years)	Males		Females	
	Total no of cases	IgM Positivity	Total no of cases	IgM Positivity
0-10	99	39	64	22
11-20	18	10	9	2
21-30	2	0	1	1
31-40	1	0	1	0
41-50	0	0	1	0
51-60	1	0	2	0
61-70	0	0	1	0
Total	121	49	79	26

Table 4: Various presenting features among the patients

Presenting Feature	Total No of cases	Percentage
Mild febrile syndrome	200	100.0
Severe headache	184	92.0
Bodyaches/Arthralgias	171	85.5
Nausea and vomiting	169	84.5
Pedal oedema	151	75.5
Skin rash	139	69.5
Pain abdomen	110	55.0
Conjunctival congestion	82	41.0
Hepatosplenomegaly	60	30.0
Altered sensorium	57	28.5
Retrobulbar pain	53	26.5
Ascitis	43	21.5
Hemorrhagic manifestations	22	11.0

The commonest presenting features in the patients are: fever (in all the cases, 100%), severe headache (n=184, 92.2%), bodyaches/arthralgias (n=171, 85.5%). The other common symptoms include hepatosplenomegaly, conjunctival congestion, nausea and vomiting, pedal oedema and skin rash (Table: 4)

Table 5: IgM Positivity in Patients with Various Presenting Features

Presenting Feature	Total No of cases	No of IgM Positive cases
Mild febrile syndrome	200	75 (37.5%)
Severe headache	184	75 (37.7%)
Body aches/Arthralgia's	171	75 (43.9%)
Nausea and vomiting	169	74 (43.8%)
Pedal oedema	151	70 (46.4%)
Skin rash	139	71 (51.1%)
Pain abdomen	110	54 (49.1%)
Conjunctival congestion	82	65 (79.2%)
Hepatosplenomegaly	60	42 (70.0%)
Altered sensorium	57	43 (75.4%)
Retro bulbar pain	53	41 (77.3%)
Ascites	43	27 (62.3%)
Hemorrhagic manifestations	22	18 (81.2%)

The study suggests that the cases presenting with hemorrhagic manifestations were found to have 81.2% in IgM positivity. The next predominant features associated with more number of IgM positive cases were retro bulbar pain, altered sensorium, Ascites, skin rash and conjunctival congestion (Table: 5).

Table 6: Distribution of cases from Rural and urban areas

	Total no of cases	IgM Positive
Rural	164	65 (39.6%)
Urban	36	10 (27.8%)
Total	200	75

The prevalence of dengue was found more among the rural population (n=65, 39.6%) when compared to the urban population (n=10, 27.8%) (Table: 6).

Discussion:

The present study was conducted on 200 cases presenting with suspected dengue fever admitted at S.V.R.R.Government General Hospital, Tirupati, from August 2007 to July 2008. Among the 200 patients tested, 75 (37.5%) were found to be positive for IgM antibodies to Dengue by, IgM capture ELISA method (PanBio Pvt Ltd, Queensland, Australia). Of the 200 cases 49 (40.5%) were positive among 121 males, 26 (32.9%) were positive among 79 females. 153 cases belonged to the 0-10 age group and among them 61 were positive (39.86%). In the present study, the ratio of the positive cases among the males and female was 1.61:1. Similar results were found in studies conducted by Rajendran (22.9%) et al [4], Gerardo Chowell (30%) et al [5] and Ira Shah (48.44%) et al [6], Rachal Daniel (66.4%) et al [7], Khanna (55%) et al [8] and Hoti (50.6%) et al [9].

In Shah et al study, the age group most affected was between 8 months and 14 years and the mean age was 8.3 years [6]. Farid Uddin Ahmed et al showed the mean age of 8.4 years [10]. In a study conducted by Ira Sha et al the mean age of presentation was 6.1 years. In another study by Hoti et al [9], 1-15 years old children were most affected. Similar observations were also made by Ang Kim Teng et al in the study conducted from 1991- 2000 in Malaysia [11]. In the present study most of the reported cases were from younger age group 0-10 yrs. These were the people who were active outdoors, whether working, schooling or playing outside their homes. *A.aegypti* is a day biter with increased biting activity 2 hours after sunrise and early hours of evening.

Rapid strip test was used for diagnosis of dengue fever. Primary dengue infection was observed in 15% of cases (only IgM) while in the rest, either or both IgM and IgG were found. Farid Uddin Ahmed et al [10] studied about the incidence of Dengue and Dengue hemorrhagic fever in 73 children admitted at Chittagong Medical College Hospital, Bangladesh. The mean age affected was 8.4 years, affecting mostly the children of 5-9 years age. 26 children were positive (36%) for dengue fever. Rajendran et al conducted a study in Sulurpet, Andhra Pradesh, India, and found 22.9% cases were positive for dengue IgM antibodies, of which 34.6% were children [4].

In the present study the seropositivity for dengue fever was 37.5%. Among the males, 49 out of 121 were positive for IgM dengue (40.5%) and among the females 26 were positive out of 79(32.9%). The incidence of dengue was more in males (40.5%) than in females (32.9%). The incidence was high in males (n=49),

because they go for outdoor work and they are more exposed to the bite of *Aedes aegypti*. A significant difference between the male and female groups was noted by Eng Eong Ooi et al [12]. He noted that males were affected more than females (1.6:1). But their study population was predominantly of adults. Siraporn Sawasdivorn et al [13], in a study concluded that the male to female ratio in their study was 1.4 to 1. Their study population was predominantly of younger age group (1-13 years).

In the present study the most common clinical presentation was fever (100%). There was also a high incidence of headache, nausea, vomiting, myalgia and rash. It was also observed in this study that the cases presenting with hemorrhagic manifestations, retro bulbar pain and altered sensorium showed concordance with IgM seropositivity for dengue. Similar observations were made in a study conducted by Malavige et al in 2007 [14].

Similar observations were also made by WHO in Thailand. Neeraja et al [15] studied 260 cases of Dengue virus infection in patients in a tertiary care hospital in Hyderabad during the period September to December 2004. Of the 260 cases, 211 gave positive results in IgG and/or IgM. 3.8% cases showed positivity in only IgM whereas 55.9% showed positivity in both IgM and IgG. The most common clinical presentations noted were mild febrile illness, thrombocytopenia (100%), headache (74%), nausea, vomiting (62%), myalgia (53%), rash (41%) and conjunctival congestion (29%).

In a study by Gerardo Chowell et al [5], the most common symptoms observed were: fever (99.6%), headache (92.4%), myalgia (89.4%), arthralgia (88.6%). The most common hemorrhagic manifestations were petechiae (7.1%), gingivitis (3.4%) and epistaxis (3.6%). Rachel Daniel et al (2003) studied 250 cases which were IgM dengue antibody confirmed cases admitted to the three major hospitals in Kollam district in Kerala.

The most common presenting symptoms were fever (96.8%), headache (77.2%), abdominal pain (62.4%), diarrhea (15.2%), bleeding tendencies (15.2%), skin rash (13.2%). Ira Shah and Bhushan Katira [6], in a study in Mumbai, screened 69 suspected cases of dengue and 34 cases were positive for dengue IgM. The most common clinical presentations were fever (100%), vomiting (95.5%), rash (14.7%) and hepatomegaly (47.1%).

Khanna et al [8] studied patients with febrile illness with clinical features suggestive of Dengue in New Delhi. Their study populations consisted of 100 cases. The most common clinical features observed by them were fever (100%), headache (73.3%), retroorbital pain (46.6%) and hepatomegaly (23.3%). Hoti et al [9]

of Indian Council of Medical Research, Pondicherry conducted a study on the 92 cases. Most of the cases were of 1-15 years age group and of the 92 samples screened, 79 were positive for Dengue IgG/IgM, but only 50.6% showed positive in IgM testing. Fever was the most common clinical presentation followed by myalgia, hemorrhage, hepatomegaly, shock and convulsions.

In the present study the transmission was more in the months of June to December. Peak incidence was seen in August to November, confirming the active transmission period, during monsoon period. Similar observations were also made by the study that was conducted by Institute of Vector Control and Zoonoses, Hosur and Directorate of Public Health and Preventive Medicine, Chennai, India from 1998-2006.

Rajendran et al in a study conducted in Sullurpet, of Andhra Pradesh, India found that more number of cases presented during the September-November (n=262) [4]. Rachel Daniel et al described that most cases were between June and December [7]. Their study group consisted primarily of adult population.

Conclusion:

The isolation of dengue viruses or demonstration of dengue viral genome sequences is useful for confirmation of dengue virus infection. These tests are only available in reference laboratories. The detection of IgM by capture ELSIA is helpful for the diagnosis of acute dengue virus infection. The serological diagnosis of dengue fever has a role in categorizing primary and secondary infection and it also serves as a predictor of disease progression and mortality especially in the severe forms i.e. DHF/DSS. Early detection of cases helps the public health authorities to take appropriate control measures to prevent the spread of the disease and also helps in the early management of cases. Community participation with emphasis on behavioral change is very much essential for sustenance of dengue control. Constant surveillance for dengue viral infection throughout our country is required to take necessary action by health authorities.

Acknowledgement:

The authors are very grateful to Dr.B.Kailasanatha Reddy, Professor and Head of department of Microbiology for his constant guidance while doing this dissertation work.

Source of conflict: Nil

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Access this article onlineWebsite: www.ijrhs.com

Submission Date: 15-06-2013

Acceptance Date: 30-06-2013

Publication date: 01-07-2013

**Corresponding Author:**

Gandikota Rajaram, Assistant Professor, S.V. Medical College, Tirupati.

Email: gandikota_scr@yahoo.co.in