



THE PREVALENCE OF DENGUE ARBOVIRAL INFECTION IN AND AROUND BELLARY DISTRICT, KARNATAKA.



Dr.Narayan Shrihari, Asst. Professor,
Department of Microbiology,
Vijayanagar Institute of Medical Sciences,
Cantonment area, Bellary-583104, Karnataka
E-mail – shriharimicro@gmail.com

ABSTRACT:

Background: An arbovirus is one that multiplies in a blood sucking arthropod and is transmitted by the bite to a vertebrate host. Dengue is an acute febrile illness endemic to the Indian sub continent. Dengue infection happens in three forms namely; dengue fever, dengue haemorrhagic fever and dengue shock syndrome.

Objective: To know the prevalence of dengue arboviral infection in and around Bellary district.

Material and Methods: The laboratory records of clinically suspected dengue patients from January 2009 to December 2011 were analyzed retrospectively and results of Ig M anti dengue antibodies tested by Ig M capture enzyme linked immunosorbant assay (Mac ELISA).

Results: A total of 1396 dengue suspected serum samples were analyzed, out of which 160 (11.46%) samples were found positive for dengue virus infection. Maximum positive cases were seen in 2009 (15.72%). The present study emphasizes the continuous sero-epidemiological surveillance for the effective dengue arboviral infection control programme.

KEY WORDS: Dengue and Ig M antibody capture ELISA

INTRODUCTION

Dengue fever is an acute febrile arboviral disease affecting the tropical and subtropical regions of the World ^[1]. Dengue fever is defined as acute febrile illness with two or more manifestations among head ache, retro orbital pain, myalgia, arthralgia, rash, haemorrhagic manifestations, leucopenia and supportive serology. Dengue fever is confirmed by four fold or greater change in antibody titer or demonstration of viral antigen ^[2]. Dengue haemorrhagic fever is defined as two to seven days of acute febrile illness with bleeding, thrombocytopenia and evidence of plasma leakage. When all the features of dengue haemorrhagic fever with evidence of circulatory failure; the patient is categorized as dengue shock syndrome ^[2]. The arboviruses are transmitted by blood sucking arthropods from one vertebrate host to another. The vector acquires a lifelong infection through the ingestion of blood from a viremic vertebrate host. The viruses multiply in tissues of the arthropod without evidence of disease or damage. Some arboviruses are maintained in nature by transovarian transmission in arthropods [Figure No: 1]. The major arboviral diseases distributed worldwide are yellow fever, dengue, japanese B encephalitis, chikungunya, St. Louis encephalitis, western equine encephalitis, eastern equine encephalitis, russian spring summer encephalitis, west Nile fever and sand fly fever^[3]. The dengue is a flue like viral disease characterized by fever, rash, muscle and

joint pain. It is spread by the bite of infected *Aedes* mosquitoes^[3]. The vector-borne disease and mosquitoes breeding sites are playing an important role in the transmission and propagation of dengue.

MATERIAL AND METHODS:

The study was conducted at a tertiary care Hospital from January 2009 to December 2011. A total of 1396 serum samples from suspected dengue cases were included in our study. Aseptic precautions, two to five ml of blood samples were collected by venipuncture for dengue suspected cases and samples were transported to the Microbiology laboratory in vaccine carriers with duly filled requisition forms. The serum was separated by centrifugation of the whole blood sample and stored in the refrigerator at -20°C^[4]. The test kits used were dengue Ig M antibody capture ELISA supplied by Group leader, Arbovirus Diagnostics, National Institute of Virology, Pune, India. The tests were performed strictly as per the manufacturers' instructions.

RESULTS:

During the three years of study period, 1396 dengue suspected serum samples were analyzed, out of these 160 (11.46%) samples were positive for dengue virus infection [Table No:1]. The prevalence of dengue is high in 2009 (15.72%) [Table No: 2]. Male to Female ratio of fever diagnosis in dengue suspected cases is 1.48 [Table No: 3] and majority of cases belong to age group more than 15 years [Table No: 4].

DISCUSSION:

Dengue has become an emerging disease with outbreaks of dengue fever or dengue haemorrhagic fever^[5]. The epidemic in 2005 occurred in the rainy season; in India epidemics are more common in late summer and pre winter^[2]. Male preponderance was found in the present study, similar finding was noticed in one study^[6]. However no sex difference was found in most of the reported studies^[7,8]. Maximum incidence of disease was found in the age group more than 15 years in our study, where as 5-10 years as it is reported in other studies^[7,9]. The serological study indicated that arthropod-borne dengue virus studied was prevalent in and around Bellary district, although the prevalence differed according to age, sex, geographic location and the individual virus. The geographical distribution had a significant influence on the prevalence of antibodies to the virus. This might be explained by the possible impact of ecological characteristics of the areas on the natural cycles of the arthropod-borne viruses under consideration^[10]. Dengue is an important emerging disease of the tropical regions. After analyzing the year wise distribution of dengue cases an unsteady increase in the number of dengue cases over the past few years was noted. The number of dengue positive cases more during 2010 (20.56%) according to one study^[11]. But in our study dengue positive cases more in 2009 (15.72%).

CONCLUSION:

The arboviral infections mainly dengue, chikungunya and Japanese B Encephalitis are most common in tropical and subtropical regions. The vector (mosquitoes) control is important preventive measure in community. The serological results (Ig M antibody capture ELISA) clearly establish the etiology.

Key message: The prevention is better than cure.

REFERENCES:

1. Datta S, Wattal C, Dengue NS1 antigen detection: A useful tool in early diagnosis of dengue virus infection, *Indian Journal of Medical Microbiology*, 2010; 28(2): 107-110.
2. Ghosh SK, Saumyen DE, Uttam S, Ghosh M, Chatterjee MK, Sandip S, Clinical profile of dengue during 2005 outbreak in Kolkata and Predictive markers of dengue haemorrhagic fever, *Journal of Indian Medical Association*, 2011; 109(11): 790-793.
3. Jawetz, Melnick, Adelberg, Arthropod borne and Rodent borne viral diseases In: *Medical Microbiology*, Chapter 38, 23rd edition, Singapore, The Mc Graw Hill Companies; 2004:514.
4. Anuradha SK, SurekhaYA, Sathyanarayan MS, Suresh S, Krishna S, Satish SP, Mariraj J, Ravikumar R , Japanese Encephalitis virus; common cause of viral encephalitis in paediatric age group in Bellary, Karnataka, India, *Journal of Clinical and Diagnostic Research*, 2011; 5(3): 480-482.
5. Moorthy M, Chandy S, Selvaraj K, Abraham AM, Evaluation of a rapid immunochromatographic device for the detection of IgM and Ig G antibodies to dengue viruses in a tertiary care Hospital in South India, *Indian Journal of Medical Microbiology*, 2009; 27(3): 254-256.
6. Kabra SK, Pandey A, Broor S, Gulera R, The evolution of Dengue over a decade in Delhi, *Journal of Clinical Virology*, 2007; 40: 87-88.
7. Kabilan L, Balasubramanian S, Keshava SM, Satyanarayana K, The 2001 Dengue epidemic in Chennai, *Indian Journal of Paediatrics*, 2005; 72: 919-923.
8. Batra P, Saha A, Chaturvedi P, Vilhekar KY, Mendiratta DK, Outbreak of Dengue infection in rural Maharashtra, *Indian Journal of Paediatrics*, 2007; 794-795.
9. Shah I, Deshpande GC, Tardeja PN, Outbreak of Dengue in Mumbai and Predictive markers for Dengue shock syndrome, *Journal of Tropical Paediatrics*, 2004; 50: 301-3015.
10. Padbidri VS, Wairagkar NS, Joshi GD, Umarani UB, Risbud AR, Gaikwad DL, Bedekar SS, Divekar AD, Rodrigues FM, A serological survey of Arboviral diseases among the Human population of the Andaman and Nicobar islands, India, *Southeast Asian Journal of Tropical Medicine and Public Health*, 2002; 33 (4): 749-800.
11. Ukey PM, Bondade SA, Paunipagar PV, Powar RM, Akulwar SL, Study of seroprevalence of dengue fever in Central India, *Indian Journal of Community Medicine*, 2010; 35: 517-519.
12. Bhatia R, Ichhpujani RL, Arboviruses In: *Essentials of Medical Microbiology*, Chapter 74, 4th Edition, New Delhi, Jaypee Brothers Medical Publishers; 2008: 401.

Table No: 1

Distribution of suspected and confirmed Dengue cases

Suspected	Confirmed	Percentage	Negative
1396	160	11.46	1236

Table No: 2

Distribution of Dengue suspected and confirmed cases according to year

Year	Dengue		
	Suspected	Confirmed	%
2009	388	61	15.72
2010	448	59	13.17
2011	560	40	07.14
Total	1396	160	36.03

Table No: 3

Distribution of fever diagnosis according to Gender of the patients

Gender	Suspected Cases
Male	833
Female	563
Total	1396

Table No: 4

Distribution of fever diagnosis according to age of the patients

Age in Years	Suspected Cases
Less than 5	079
5 to 10	124
10 to 15	147
More than 15	1046
Total	1396

Figure No: 1

Arbovirus life cycle ^[12]

