



Original Research Article

Changing Trend of Dengue Fever in and around Nanded- A Seven Years Study

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ABSTRACT

Dengue virus infection has emerged as a notable public health problem in recent decades in terms of the mortality and morbidity associated with it. Dengue is endemic in many parts of India and epidemics are frequently reported from various parts of India and abroad. Dengue infection has been known to be endemic in India for over the centuries as a benign and self limiting disease.

Dengue cases were more during September to November in the post monsoon season which is useful to plan special preventive strategies. The study draws attention towards changing trends of dengue infection as number of cases was more from an urban area, but now it has penetrated in rural areas also.

Here we are reporting the changing trend of dengue fever cases from and around Nanded for a period of August 2008- September 2014. Serum samples of suspected dengue fever cases were tested for dengue specific IgM antibodies using IgM capture ELISA (MAC ELISA, NIV Pune). A total of 2404 serum samples were tested, of which 270 (11.23%) were positive for dengue. Out of 2404 samples 2138 samples were tested for Dengue IgM antibodies and 266 for NS1Ag, of which 94 were positive for NS1Ag and 138 for IgM antibodies. The Male patients were 1160 and 1244 females. The 155 male and 115 females were positive. The urban and rural population was 1407 and 997. The dengue affected cases were more in 0-20yrs age group with male predominance. The rural population was affected more as compared with urban population s. Maximum number of cases were reported in the year 2014.

Key Words: Dengue, IgM capture ELISA, DF (Dengue fever), DHF (Dengue haemorrhagic fever).

INTRODUCTION

Dengue fever is the most common arthropod-borne self limiting viral disease with clinical spectrum ranging from asymptomatic infection to life threatening shock so called dengue shock syndrome [DSS].

Since the 18th century, dengue has caused repeated epidemics worldwide. Dengue is transmitted by several species of

mosquito within the genus *Aedes*, principally *A. aegypti*. Four dengue viruses (types 1-4) within the genus flaviviruses and family flaviviridae. [1,2] Dengue infection has been known to be endemic in India for over the centuries as a benign and self limiting disease. [3] In recent years, the disease has changed its course manifesting in the severe form as Dengue haemorrhagic fever [DHF] and with increasing frequency of outbreaks

[4,5] According to published reports all four serotypes are known to be circulating singly or in combination, resulting in several out breaks over the years. [1,3] Current emerging situation of dengue in India is as Outbreaks of dengue fever (DF) have been reported from various parts of countries. [4,5] Dengue outbreaks have been continued since the 1950s but severity of disease has increased in the last two decades. [6] The peak of illness is during monsoon and post-monsoon season due to high vector density. Previously dengue infection was considered an urban problem, but it has now penetrated into rural areas also. [2] Here we are reporting the study of changing trend of dengue fever in and around Nanded.

MATERIALS AND METHODS

The present study was conducted in the Department of Microbiology, Dr. Shankarrao Chavan Government Medical College & Shri Guru Govind Singhji Memorial Hospital Nanded, Maharashtra; over a period of 7 years from August 2008 to September 2014. A total 2404 serum samples were collected from clinically suspected cases of dengue fever classified as undifferentiated fever/dengue fever /DHF (WHO classification). The patients sample and data was recorded. 2 to 5 ml blood samples were collected from clinically suspected cases of dengue virus infection in the age group of 6 months to 80 years from urban and rural populations. These samples were stored at 8⁰C and Dengue virus

specific IgM was tested by antibody capture ELISA (MAC ELISA) using kits supplied by National Institute of virology [NIV], Pune. NS1Ag was detected by using Early ELISA kit (Panbio & J. Mitra & co.) OD was measured at 450 nm using ELISA reader. The platelet count was done to know the thrombocytopenia. A detailed clinical history of all the cases was taken using a structured clinical data sheet. The details of month wise distribution of male and female patients (Table.1), age group wise distribution of cases (Table.2), year wise distributions of male and female positive cases are shown (Table.3)

RESULTS

A total 2404 serum samples were tested, 270 (11.23%) samples were found positive. The 1160 (49.47%) were male and 1244 (50.53%) were female patients. Among these 1407 (27.34%) were rural population and 997 (72.66%) from urban population. The 155 (44.92%) male cases were dengue positive and 115 (55.07%) were females. 48 males and 46 females were positive for NS1Ag. This seven years study data shows that the number of cases were found to be highest in year 2013 (625), minimum number of cases were in year 2010(98). The number of cases was maximum in age group 0-20 years, while minimum in 61-80 years age group. Positivity of dengue cases was found more in rural population as compared to urban population.

Table No.1: Month wise distribution of Male and Female cases

Year	January-March		April-June		July-September		October-December		Total
	Male	Female	Male	Female	Male	Female	Male	Female	
2008	0	0	0	0	42	43	28	31	144
2009	3	9	16	16	44	46	41	45	220
2010	17	9	9	11	10	18	14	10	98
2011	9	4	0	2	63	66	65	68	277
2012	10	13	12	13	84	80	96	117	425
2013	22	14	23	23	171	154	99	109	615
2014	28	29	62	57	204	245	-	-	625
Total	89	78	122	122	618	652	343	380	2404

Table No.2: Age group wise distribution of dengue cases

Year	2008	2009	2010	2011	2012	2013	2014	Total
Age group								
0-20 years	83	124	32	100	240	285	272	1136
21-40 years	34	68	50	112	110	211	178	763
41-60 years	24	21	11	56	60	75	90	337
61-80 years	3	7	5	9	15	44	85	168
Total	144	220	98	277	425	615	625	2404

Table No.3: Year wise distribution of Male and Female positive cases

Year	Male	Female	Total
2008	5	7	12
2009	39	21	60
2010	1	3	4
2011	8	7	15
2012	19	22	41
2013	30[16*]	25[8*]	55[24*]
2014	53[32*]	30[38*]	83[70*]
Total	155[48*]	115[46*]	270[94*]

*: NS-1 positive cases

DISCUSSION

Dengue, a Flavivirus transmitted by *Aedes* mosquitoes, are a cause of great concern to public health in India. Every year, thousands of individuals are affected and contribute to the burden of health care. [5] Dengue is emerging as a major public health problem in India. It is one of the major public health threats in Kolkata. Since the first epidemic in Kolkata during 1963-64, many places in India have been experiencing dengue infection. [7] A major widespread epidemic of dengue haemorrhagic fever (DHF) occurred in 1996 involving areas around Delhi and Lucknow. [4,8] Dengue infection has been known to be endemic in India for over two centuries as a benign and self-limited disease. In recent years, the disease has changed its course manifesting in the severe form as DHF and with increasing frequency of outbreaks. [9] India witnessed widespread dengue fever outbreak in the year 2012. Tamil Nadu reported the highest number of cases in the country being 9,249, followed by West Bengal which reported 6,067 cases. The other states which also reported increased number of dengue cases were Maharashtra, Kerala, Karnataka, Odisha, Delhi, Gujarat, Puducherry, Haryana, and Punjab. [10]

Delhi has experienced seven outbreaks of dengue virus since 1967 with the last reported in 2003. [7] Similar outbreak of dengue in Mumbai was reported in 2003. [11,12] Our report shows an increasing number of dengue virus infection cases from July to November. The maximum number of cases was reported in 2014 and highest numbers of cases were recorded in the age group 0-20 years with male predominance. Similar type findings were also reported by Gupta et al [9] from Delhi and Chakravarti and Kumaria. [13]

The numbers of cases from rural population were more as compared with the urban population. Our findings were similar to those reported by other groups. The majority of the cases were reported during the monsoon and post monsoon seasons. [4,7] Cases of dengue fever started increasing in the last week of June or early July every year and reached at peak during August to October. A seasonal peak of DV infection was recorded around 4-6 week after arrival of rain every year. [4]

Rain, temperature and relative humidity are reported as the major and important climatic factors, which could alone or collectively be responsible for an epidemic. Studies have proposed that ecological and climatic factors influence the seasonal prevalence of the vector *Aedes aegypti* and dengue virus. [13,14] The vector has adapted to extremes of warm and cold weather resulting in occurrence of dengue cases round the year. [4] An increase in the Dengue fever cases was seen in 2014. Minimum number of cases in 2010 and a consistent rise was seen in the number of

dengue cases. This change was related to changes in environmental factors.

CONCLUSION

Appropriate investigation, strict monitoring and prompt supportive management can reduce mortality of dengue. Also, prevention of transmission by mosquito control & maintaining water sanitation is required to control dengue infection.

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