ORIGINAL ARTICLE

Recurrence of Dengue Epidemic in Ludhiana-2003

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Abstract

Dengue with its severe manifestations- Dengue haemorrhagic fever(DHF) and Dengue shock syndrome(DSS) is now becoming an increasing threat in many parts of the world. An epidemic of febrile illness with haemorrhagic manifestations broke out in Ludhiana from September-November 2003. Serological investigations were conducted to find out the etiology of the febrile illness. Serum samples were collected from all patients coming to the hospital with acute symptoms and tested by ELISA for anti-dengue IgM antibodies. Of the 2309 samples tested, a total of 586 samples were positive for anti-dengue IgM antibodies and another 98 samples were reported to be in the grey zone. With epidemics occurring in the recent past both in 1996 and 1999, the febrile illness was serologically concluded to be dengue hemorrhagic fever.

Key Words

Dengue Hemorrhagic Fever, Dengue Shock Syndrome.

Introduction

Dengue is increasingly becoming an escalating problem all over the world (1) and has now become endemic in many parts of India. Dengue has been reported from Gujarat as early as in 1913 and more recently epidemics have been reported from Maharashtra (2,3), Gujarat (4), Calcutta (5), Rajasthan (6) and Punjab (7).

Dengue is the most important mosquito borne viral disease affecting humans. Female Aedes mosquito, the vector of the virus is peridomestic in nature. The tropical zone of the world having monsoon range is the usual habitat of this vector (8). The breeding of Aedes aegypti is highest during the pre and post monsoon periods (9). Dengue shock syndrome and Dengue haemorrhagic fever are severe clinical manifestations of the disease. Thus there is a pressing need for prevention, early detection and treatment of the disease.

An outbreak of febrile illness with haemorrhagic manifestations was reported from many parts of North India during September to November 2003. Here we report a similar outbreak in Ludhiana during the same period.

Materials and Methods

Patients were suspected to be as dengue patients, those who had come to the Christian Medical College and Hospital, Ludhiana with complaint of fever, headache, malaise, myalgia and arthralgia, or who developed a maculopapular rash on the 3rd or 4th day of illness. Others with haemorrhagic manifestations such as epistaxis, bleeding gums and conjunctival haemorrhage were also included in the study. Criteria for diagnosis was based on WHO case definition of Dengue Haemorrhagic fever (8).

Blood samples during acute phase of illness were collected from the patients. Biochemical and serological investigations were conducted. Serological investigations for the detection of anti-dengue IgM antibodies sera were conducted. Sera was separated and stored at -20^{O}C. They were then tested by ELISA (NOVUM DIAGNOSTICS,GERMANY) which could detect IgM antibodies against all serotypes of dengue virus. Tests were put up according to manufacturer's instructions and optical densities were read in the ELISA reader at 450nm, using 650nm as the reference wavelength. Cut-off values were calculated and those samples whose OD were more than 10% above that of the cut-off value were reported as positive for anti-dengue IgM antibodies.

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Isolation of virus was not attempted and dengue IgG detection was not done due to non-availability of kits.

Results

It was found that individuals of all age groups were equally affected with a significant proportion of children also presented with similar clinical symptoms. Tests conducted revealed that most patients had hypoproteinemia, thrombocytopenia with platelet counts varying from 50,000 - 1,00,000/mm3 and elevated liver enzymes. A total of around 2309 samples were received in the Microbiology Laboratory to be tested for anti-dengue antibodies. 586 serum samples tested positive for anti-dengue IgM antibodies whose values were 10% above that of the cut -off. 98 samples were reported to be in the'Grey zone' - this included those samples whose absorbance values fell between 10% above to 10% below that of the cut-off. These patients were asked to repeat the test after 1-2 weeks. Of the infected persons we found 25.37% of the patients positive for anti-dengue IgM antibodies denoting primary dengue infection. Rest of the other patients showed clinical manifestations of dengue with even low platelet counts but the serology was negative probably due to early investigations for antibody detection.

Discussion

Dengue with its severe manifestations - dengue haemorrhagic fever and dengue shock syndrome is now endemic in more than 100 countries in Africa, the Americas, the Eastern Mediterranean, South-East Asia and the Western Pacific (10,11).

A few cases of authenticated DHF were recorded and reported from Calcutta between 1963 and 1965 (12) and also in 1983 (5) and 1990 (7,13). DHF has also been reported from Surat and Shahjanpur in 1994 (7,14). More recently, the 1996 epidemic in Northern India was reported to be mainly due to dengue virus type 2 (7,11). In an outbreak once the etiology becomes evidence all the similar symptomatology are usually diagnosed accordingly and control measures are initiated (15).

In the present study, serological investigations on serum samples established the dengue virus etiology of the febrile illness. Serotype identification could not be done in our laboratory as the commercial kits used for serotesting did not differentiate between the serotypes. However, it has been reported recently that the 2003 epidemic was caused by dengue virus type 3 (11).

It is an established fact that dengue has now become endemic in many parts of India. It is also noted that recurrent outbreaks occur every 2-3 years following the rainy season. The mortality rate associated with the recent epidemic was very low due to the prompt and effective treatment given to the patients.

The factors contributing to the increased incidence of dengue and emergence of dengue haemorrhagic fever are intensifying. Until the Aedes mosquito can be effectively controlled or a cost effective vaccine developed, dengue can be expected to continue to escalate.

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