ORIGINAL ARTICLE

Clinical Characteristics of Dengue Fever in a Medical Center of Lahore during 2010 Epidemics

YASMINE LODHI, MARIAM MUSTAFA FAROOQI

ABSTRACT

Dengue is a widespread arthropod-borne infection in human beings, which in recent years has become a major international public health concern. Symptomatic dengue virus infections can present with a wide range of clinical manifestations, from a mild febrile illness to a life-threatening shock syndrome. It is now the most frequent arboviral disease in the world, with an estimated 100 million cases of dengue fever annually, 250,000 cases of dengue hemorrhagic fever, and 25,000 deaths per year[1].

Material and Methods A total of 80 blood serum samples were collected from suspected patients of dengue fever, aged 4 to 65 years, admitted at medical center in Lahore, and were subjected to hematological, serological analysis using standard laboratory procedures including Enzyme Linked Immunosorbent assay (ELISA) for the determination of Dengue specific IgG and IgM antibodies.

Results Out of 80 blood samples 50 (62.5%) were confirmed as having significant dengue IgM antibody titer and dengue IgG antibody titer.Aged from 4 years to 76 years, with 29(58%) males and 21(42%) females Out of which 44 (88%) were IgM positive, 30(60 %) were IgG positive and 25(50%) were both IgG and IgM positive. Common presenting symptoms were fever (100%), vomiting (78%), epigastric pain (52%), bleeding tendencies (34%), and erythematous rash (33%).37(74%) presented with bicytopenia, Thrombocytopenia 35(70%), Leucopenia 26(52%), were the predominant.

Conclusion It was estimated that endemicity of DF is on the rise in Lahore and a significant proportion of patients had Dengue Fever/Dengue Hemorrhagic Fever. This paper discusses the need of an appropriate framework for approaching the environmental control of Dengue virus/Dengue Fever/Dengue Hemorrhagic Fever with reference to the current situation of the flooding and flood related disasters in a resource limited country such as Pakistan.

Key words: Dengue, Dengue Hemorrhagic fever, Thrombocytopenia, bicytopenia, Leucopenia

INTRODUCTION

Dengue virus infection is increasingly recognized as one of the world's emerging infectious diseases. About 50-100 million cases of dengue fever and 500,000 cases of Dengue Hemorrhagic Fever (DHF), resulting in around 24,000 deaths, are reported annually[2]. Pakistan first reported an epidemic of dengue fever in 1994. In Asian countries where DHF is endemic, the epidemics have become progressively larger in the last 15 years. In 2005, dengue is the most important mosquito borne viral disease affecting humans[3]. Dengue virus is now endemic in Pakistan, circulating throughout the year with a peak incidence in the post monsoon period.

Dengue fever is an acute infectious disease caused by an arbovirus in the Flavivirus genus. The disease manifestations range from a flu like illness known as dengue fever (DF) to a severe and at times fatal disease characterized by haemorrhage and/or shock, known as dengue haemorrhagic fever/dengue shock syndrome (DHF/DSS). There are four viral serotypes (DEN-1, DEN-2, DEN-3, and DEN-4). The virus transmits from viraemic to susceptible humans mainly by bites of the Aedesaegypti and Aedesalbopictus mosquito species[4].

WHO Case definition Dengue fever is a severe, flu-like illness that affects infants, young children and adults, but seldom causes death. The clinical features of dengue fever vary according to the age of the patient. Infants and young children may have a non-specific febrile illness with rash. Older children and adults may have either a mild febrile syndrome or the classical incapacitating disease with abrupt onset and high fever, severe headache, pain behind the eyes, muscle and joint pains, and rash[5].

Clinical presentation may vary from undifferentiated fever, classic dengue fever (DF), Dengue hemorrhagic fever (DHF) to Dengue shock syndrome (DSS). The risk of severe disease is much higher in sequential rather than primary dengue infection[6].

Department of Pathology, Lahore Medical & Dental College, Lahore
Correspondence to Dr. Mariam Mustafa Farooqi, Assistant Professor Email: drmariamn@hotmail.com

Usually clinical suspicion for Dengue fever is sufficient for supportive treatment. Complete blood picture may show high hematocrit, leucopenia and thrombocytopenia. Other laboratory tests include serum albumin, chest X ray if required. Diagnosis of dengue fever or its complications is established by culture of the virus itself, by detection of viral DNA with use of PCR, or by serological methods. Although detection of specific IgM indicates fresh infection, a significant increase in IgG titer in paired serum samples is also sufficient for diagnosing dengue fever immunofluorescence tests, and hemagglutination assays. Low white cell count, low platelet count, abnormal liver function test, IgM ELISA test for serologic diagnosis, IgM detectable 5, 6 days after the onset of illness, IgG: day 14 of illness in primary and day2 in secondary infections[7].

MATERIALS AND METHODS

The study was conducted during the period of August 2010 to October 2010. A total of 50 blood samples were collected from suspected patients of dengue fever, aged 4 to 76 years at medical center in Lahore. All 50 patients had health checkups by a medical doctor before collection of specimens, they were asked about any history of fever, mosquito bites, jaundice, blood transfusion and their platelet counts were determined. Following the completion of history abdominal physicals, patients were requested to give 5mL of blood for different hematological screening tests including complete blood picture (CBP), hemoglobin percentage (Hb%) and 5mL of blood for IgM and IgG antibodies against dengue virus using rapid immunochromatography kits , and Confirmatory test by using ELISA. was also noted.

RESULTS

Blood samples of suspected cases of Dengue infection (N=459), received during August 2010 to October 2010 two different pathological laboratories were included in this study. More samples were collected in the months of September, October and with the highest numbers in October 2010. In a total of 80 suspected cases, 50 (62.5%) were confirmed of having low platelet counts (100,000/cmm or less), decreased leukocyte count (<4.0) in 26 (52%), Out of those 50 thrombocytopenic patients 44 (88%) were IgM positive, 30(60%) were IgG positive and 25 (50%) were both IgG and IgM positive (Table 1). Seroprevalence of dengue fever or dengue hemorrhagic fever was mainly observed in the middle aged group patients of age between 20 – 45 years of age, most of the patients were male i.e. 29(58%) out of the total 50 suspected cases of dengue.

Table 1 Results in suspected patients of Dengue Fever

Laboratory findings	=n	%age
Thrombocytopenia	50	62.5
Leukopenia	26	52
IgG antibodies	30	60
IgM antibodies	44	88
IgG/IgM antibodies	50	25

All patients received symptomatic and supportive treatment including intravenous fluids, antiemetics and antipyretics. Blood and blood products, antibiotics and ionotropic/vasopressor support were administrated as and when required.

DISCUSSION

Dengue fever is mostly a rather undifferentiated febrile disease with non-specific signs and symptoms. Molecular and serological tests are used to confirm the clinical diagnosis. In Lahore alone we have approximately 195 registered hospitals and pathological laboratories and several other unregistered laboratories. Out of these only 10% of the laboratories have facilities available for serological confirmation of dengue by commercially available assays. As per our knowledge, most of these laboratories are using rapid immunochromatography kits and Enzyme Linked Immuno Sorbent Assay (ELISA); few of them have facilities for polymerase chain reaction (PCR) based diagnosis of dengue. The applicability and quality of serological tests in dengue endemic regions has to be judged against a background of potential cross reactivity with other flaviviridae, difficulties in distinguishing primary from secondary infections and technological problems are present and related to the fact that most dengue endemic regions are relatively poor of resources[8]. Early diagnosis on the basis of clinical picture and history of mosquito bite is helpful but appropriate serological diagnosis for the DF/ DHF is more important particularly with reference to quick treatment procedure as it is evident that the patient may die within 12 – 24 hours if not treated promptly[9].

Our findings show that the seroprevalence ratio of dengue among the suspected population of Lahore, on the basis of clinical appearance is 62.5%% (i.e., 50 out of 80 cases), Out of these 50 cases platelet count was found below normal range in 35(70%), Lecukocyte count was low in 26(52%), while Another important finding was raised serum IgM level in 44 i.e., 88% patients (Table 1).

Due to ambient temperature and humidity in the environment, this period is supposed to be ideal for mosquito breeding[10,11]. The deadly mosquitoes mainly affect heavily crowded locations of the city along with slum areas. During this study maximum suspected cases were of the male gender, which

may be attributed to of the fact that in Asian culture, comparatively, males spend more time outside their houses and thus are more likely to be exposed when compared to females[12,13,14]. Ahmed et al, have also reported the incidence of dengue more in males than in females[15].

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