

Original Article

CLINICAL SPECTRUM OF DENGUE FEVER IN PEDIATRIC AGE GROUP AT A TERTIARY CARE HOSPITAL IN LAHORE

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Objective: To assess frequency of various clinical presentations of dengue fever in pediatric age group at a tertiary care hospital in Lahore.

Methods: A cross sectional survey was conducted from Dec 2012 to Sep 2013 in pediatrics department of Jinnah hospital Lahore. 150 patients were enrolled as per inclusion criteria. Clinical features were abstracted on a standardized Performa and investigations were done, including complete blood count, hematocrit, anti-dengue IgM (If fever more than 5 days), NS1 antigen (If fever less than 5 days) by Elisa and ultrasound scan of abdomen to document free fluid in abdominal or thoracic cavity. Data was analyzed using SPSS Version 17.

Results: One hundred and fifty patients with mean age of 8.4 years (SD of ± 2.8 years) were enrolled. 86 patients (57.3%) were males with male to female ratio of 1.3: 1. High grade fever was present in all the 150 patients (100%) & Diarrhea in 21(14 %) patients. Other clinical features included: petechiae in 25 (16.3%), epistaxis in 20 (13.3%), hematemesis in 8 (5.3%), hepatomegaly in 33(22%) and splenomegaly in 15 (10%) subjects. The evidence of dengue hemorrhagic fever was seen in 23 patients (15 %), while there was no case of Dengue Shock Syndrome.

Conclusions: Most of dengue fever cases were from 5 to 10 years of age group. High grade fever was the most common clinical manifestation of dengue fever, followed by hepatomegaly, petechiae, diarrhea, epistaxis, splenomegaly and hematemesis. Dengue fever was more common in males as compared to females, and about one in six cases had dengue hemorrhagic fever.

Keywords: Dengue fever.

Introduction

Dengue fever (DF) is an acute infectious disease of antiquity. It is probably the most important arthropod-borne viral disease in terms of human morbidity and mortality, with 100 million infections occurring annually, for which no effective therapy exists.¹ DF is caused by any of the four serotypes of Dengue Virus, a member of Flavivirus family. The principle vector for dengue is *Aedes Aegypti*, a highly urbanized, daytime biting mosquito that breeds in stored water. The clinical spectrum ranges from a self-limiting infection to more severe forms like dengue hemorrhagic fever (DHF) or dengue shock syndrome (DSS) with a mortality rate of up to 40 percent.² All four dengue serotypes are now endemic around the globe. Pakistan is now hyper endemic showing co-circulation of all four serotypes.^{3,4}

Infection with one type of virus imparts life-long immunity against that particular virus and partial transient immunity against the other three types of viruses. The risk of severe disease is much higher

in sequential rather than primary dengue infection.

Dengue fever (DF) is usually characterized by fever, headache, myalgias and arthralgias, as some of the prominent symptoms. It may be associated with severe thrombocytopenia and clinically significant bleeding, but it is rarely life-threatening.⁵ DHF is an entity characterized by a transient and rapid increase in vascular permeability with hemo-concentration, thrombocytopenia, and in the most severe cases, hypovolemic shock and coagulopathy.^{5, 8} The most serious forms include dengue hemorrhagic fever and dengue shock syndrome, having high case fatality rate of up to 5%.¹⁸ Laboratory investigations usually done include hemoglobin (Hob gm %), total and differential leukocyte count (TLC and DLC), platelet count (PLT count), hematocrit (HCT). Non-structural antigen1 (NS1) and PCR is done to identify the virus and its genotype. Other tests are liver function tests (LFT) including prothrombin time (PT), serum albumin, IgM& IgG antibodies for dengue fever, ultrasound abdomen and chest X ray.⁶ Various studies conducted in Thailand¹¹, SriLanka¹⁰,

and Bangladesh¹² on clinical spectrum of dengue fever in children showed that clinical features of dengue fever has different prevalence in different regions.

A few examples of the variable range of signs and symptoms in different population show that bleeding manifestations were seen in 11% of patients in Thailand as compared to 59% in Bangladesh. Fever was reported in almost all cases except for one study conducted in Bangladesh showing only 76 % cases of Dengue Fever with fever. Similarly, variable frequency of other clinical features e.g. diarrhea, bleeding manifestations, hepatomegaly and splenomegaly is also reported across various geographical regions.

The occurrence of dengue fever in Pakistan has shown a rising trend. However local data on various clinical manifestations of dengue infections in children is scarce. We conducted this study to assess frequency of various clinical features and presentations of dengue fever in pediatric age group in a tertiary care hospital of this region in order to compare the variability of clinical signs with other adjacent geographical areas.

Methods

A cross sectional survey was conducted from Dec 2012 to Sept 2013 (nine months) in Pediatrics Department of Jinnah Hospital, Lahore. Taking an expected percentage of hematemesis i.e. 6% (least among all) of various clinical presentations of dengue fever, a confidence interval of 95% and a margin of error of 4%, a sample size of 150 cases was calculated. Patients were enrolled using non-probability / purposive sampling. Patients were included if they fulfilled the following criteria:

Inclusion criteria:

- a Confirmed case of dengue fever (as per operational definition)
- a Age up to 13 years
- a Either gender

(Dengue fever: Clinical features suggestive of dengue fever (as per WHO), plus positive NS1 antigen or positive IgM)

Exclusion Criteria:

- a Super added infection e.g. malaria diagnosed by slide positivity.
- a Children with any other chronic disease e.g. CCF, Aplastic anemia

After informed consent, 150 subjects, fulfilling the inclusion criteria were recruited for the study and complete demographic profile was taken. History

was taken regarding fever, diarrhea, epistaxis, hematemesis and occurrence of dengue cases at the same location. Clinical examination in the form of vital signs and general physical examination was done to document petechiae and fever. Blood sample was taken for hemoglobin, hematocrit and platelets count, anti-dengue IgM (If fever more than 5 days) and NS1 antigen (If fever less than 5 days) by Elisa technique. Ultrasound abdomen and chest was done to document hepatomegaly, splenomegaly and plasma leakage (ascites, pleural effusion).

All information was recorded in a structured questionnaire. Data was entered and analyzed in SPSS version 17.0. Numerical variables like age were presented as mean and SD. Frequency tables and percentages were generated for fever, diarrhea, epistaxis, hematemesis, hepatomegaly, splenomegaly, petechiae for different age and gender strata.

Results: A total of 150 patients were included in this study to document the clinical features of dengue fever during a period of nine months. Age ranged from 1 year to 14 years with a mean age of 8.4 years and standard deviation (SD) of ± 2.8 years. Majority patients were from age group 5-10 years (n=90, 60%), followed by 10-14 years (n=40, 26.7 %) and <5 years (n=20, 13.3%). Most patients were male (n=86, 57.3%) and male to female ratio was 1.3:1. Amongst all 150 subjects 86 (57.3%) were males and 64 (42.7%) females. Male to female was 1.3: 1.

High grade fever was present in all the study cases (100%) and diarrhea in 21(14 %) patients. A number of hemorrhagic manifestations were observed including petechiae in 25 (16.3%) patients, epistaxis in 20 (13.3%) patients and hematemesis in 8 (5.3%) subjects. An evidence of hepatomegaly was found in 33(22%) patients and splenomegaly in 15 (10%) patients. 23 (15%) patients had evidence of plasma leakage and labeled as dengue hemorrhagic fever. There was no case of dengue shock syndrome (DSS).

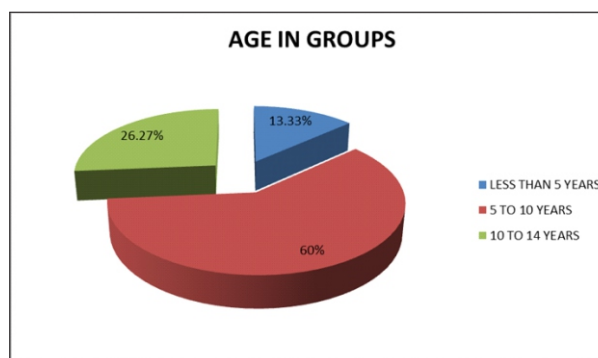


Fig-1: Age Distribution.

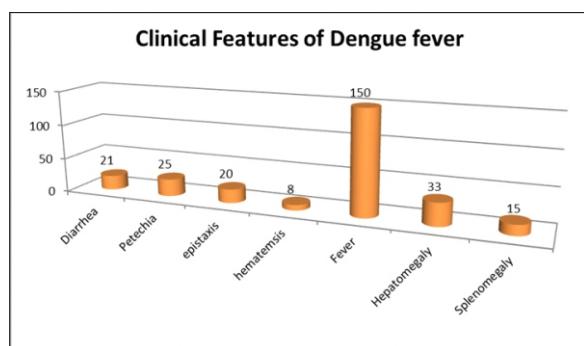


Fig-2: Clinical features of dengue fever.

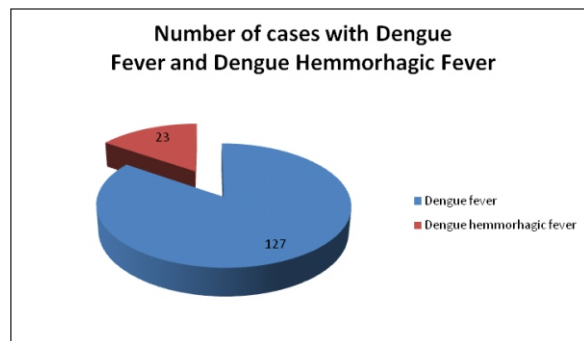


Fig-3: Clinical features of dengue fever.

Discussion

The frequency of various clinical manifestations varies across the region. It can partly be explained on the basis of various dengue virus serotypes and other genetic & environmental factors.¹⁶ Since we only included symptomatic patients, fever being essential criteria of dengue fever by World Health Organization (WHO) was the most common presenting symptom. In our study all cases were having high grade fever in comparison to a study conducted in Bangladesh¹² where only 75.9% of study patients had high grade fever. Dengue viruses can involve almost any organ system. The evidence of gastrointestinal involvement in the form of diarrhea was seen in 14% patients in our study. This frequency is higher than that reported in other countries like Bangladesh¹² (9.3%) and India⁹ (6.2%). However, an even higher percentage of diarrhea has been reported from other cities of Pakistan e.g. Karachi⁷ (25.5%) and Faisalabad (17%). The difference across countries & cities in Pakistan can be partly explained on the basis of circulation of different Dengue virus serotypes, for example, all⁴ serotypes were reported from Lahore in 2009, while DENV 2 was responsible for the large outbreak in 2011. Frequency of hemorrhagic manifestations is also variable across different studies. These manifestations are more common in

patients with evidence of thrombocytopenia, vascular fragility (Positive Hess test) and evidence of plasma leakage. However, minor bleeding is commonly seen in cases of Dengue Fever and there is no correlation between platelets count and bleeding risk.¹⁵ The most common bleeding manifestation was petechiae (16.7%) followed by epistaxis (13.3%) and hematemesis (5.3%). The observed frequency of petechiae (16.7%) is comparable to that seen in North India⁹ where a similar figure of 16.7% was reported but is lower as compared to a study in Thailand¹¹ (36%) and Karachi⁷ (42%). It was higher than reported in a study conducted in Bangladesh¹² (7.4%) and Srilanka¹⁰ (7.7%). Frequency of epistaxis was 13.3% in our study which is almost similar to that in a study in Philippine¹⁴ (11%) and much higher than in a study conducted in India⁹ (2.5%) and a study in Srilanka¹⁰ (6%). Hematemesis was present in 5.3% of patients in our study which is similar to a study in Srilanka¹⁰ (6%) but higher than that in study in India⁹ (1.3%) and lower than that in Bangladesh¹² (13%). Hepatomegaly was present in 22% of our study cases. This frequency was much lower than the study conducted in India⁹ (60%) and Bangladesh¹² (31.5%). Splenomegaly was present in 10% of patients in our study and that is almost comparable to the Indian data⁹ (11.8%) and was much lower than that in another study in North India (60%). On the contrary frequency of splenomegaly in our study was higher than a study in Bangladesh¹² where it was found to be 3.7%. One interesting finding in our study was the number of cases with evidence of dengue hemorrhagic fever e.g. 23 patients (15%) which was much less than reported in a study in Bangladesh having 59% DHF. In our study no case of dengue shock syndrome was reported. In a study conducted in North India⁹ reported percentages were dengue fever (8%), dengue hemorrhagic fever (51%) and dengue shock syndrome (42%). This is again much higher percentage of DHF and dengue shock syndrome as compared to our study. In a study conducted in Sri Lanka¹⁰ number of DF cases was 17.3% while 82.7% had DHF. This difference can be explained by difference strains in different regions and the phenomena of primary vs. secondary infection. In our data no death was reported in pediatric age group, and this was in contrast to adult patients studied in the same hospital in 2011 where the death percentage was 3.5%.¹⁷ Difference in clinical features might be explained by the prevalence of different strains of DENV in different areas and also may be differently causing DF and DHF, but further studies are required to document the clinical features

of dengue fever and dengue hemorrhagic fever.

Conclusion: Most of dengue fever cases were from 5 to 10 years of age group. High grade fever was the most common clinical manifestation of dengue fever followed by hepatomegaly, petechiae and diarrhea. Dengue fever was more common in males

as compared to females. Around one in six patients had dengue hemorrhagic fever.

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