

A Study of Clinical Spectrum of Dengue Fever in A Tertiary Care Centre.

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Abstract:

Introduction: Dengue viruses, of the family *Flaviviridae*, are the most common cause of arboviral, disease in the world. We report a clinico-epidemiological study of the dengue fever from paediatric department of civil hospital Ahmedabad. This study was designed to document the presenting features, laboratory results and outcome of dengue infection in children. **Methodology:** A prospective study was carried from October 2014-october 2015 and total of 126 patients were studied from age group between 1 month to 12 years. A detailed history, careful clinical examination and laboratory investigations were done in all the patients. **Results and Conclusions:** We documented Leucopenia as an early marker than thrombocytopenia and were seen in more numbers (47%) in our study which was not found in the previous studies. Most common symptom was fever with body ache (73%). Majority of patients had platelet count between 50000-1 lakh. 55% had tested positive for dengue IgM and 44.4% had tested positive for dengue NS1. Wide variety of *complications* like hepatitis (20.6%), myocarditis (14.2%), dengue shock (11.1%), encephalitis (4.7%), Dengue haemorrhagic fever (4.7%), ARDS (2.3%) were seen, which might indicate a change in serotype and epidemiology of the Dengue. Interestingly *Bradycardia* was seen in increased frequency subsequent to myocarditis with simultaneously raised CPK-MB levels. There were increased cases of coinfections like malaria, enteric, hepatitis, UTI, not seen previously. Out of 126 patients 6 patients expired.

Keyword: Bradycardia, Dengue fever, Myocarditis.

Introduction:

Dengue is an acute viral infection with potential fatal complications. The first clinically recognized dengue epidemics occurred almost simultaneously in Asia, Africa, and North America in the 1780s. The first clinical case report dates from 1789 of 1780 epidemic in Philadelphia is by Benjamin Rush, who coined the term “break bone fever” because of the symptoms of myalgia and arthralgia. In India first outbreak reported in Madras in 1780.

Dengue viruses (DV) belong to family *Flaviviridae* and there are four serotypes of the virus referred to as DV-1, DV-2, DV-3 and DV-4. DV is a positive-stranded encapsulated RNA virus and is composed of three structural protein genes, which encode the nucleocapsid or core (C) protein, a membrane-associated (M) protein, an enveloped



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(E) glycoprotein and seven non-structural (NS) proteins. It is transmitted mainly by *Aedes aegypti* mosquito and also by *Aedes albopictus*. All four serotypes can cause the full spectrum of disease from a subclinical infection to a mild self-limiting disease, the dengue fever (DF) and a severe disease that may be fatal, the dengue haemorrhagic fever/dengue shock syndrome (DHF/DSS)¹. The WHO estimates 50 million dengue infections occur annually and almost half the world's population lives in countries where Dengue infection is endemic (W.H.O., 2008). Over the last 10 -15 years Dengue Haemorrhagic Fever has become a leading cause of hospitalization and death among children in SEAR countries following Diarrheal and acute respiratory infections (W.H.O., 1999). Dengue Fever has been reported from India over a long time but DHF was first reported in 1963 from Calcutta city (Dengue report, 2007)^{1,2,3}. The exact clinical profile is important for patient management and thus crucial for saving lives. The present study is an attempt to describe the clinical as well as laboratory findings of serologically confirmed hospitalised cases of dengue fever during the study period.

Materials and Methods:

This is a prospective observational study, carried out from October 2014 to October 2015 in paediatric department of civil hospital Ahmedabad. A written informed consent was obtained from the child's parents. Total 126 patients were studied.

Inclusion criteria: All laboratory confirmed cases of dengue fever within age group of 1 month to 12 years were included (NS1/IgM positive)

Exclusion criteria: Patients <1 month & > 12 years were excluded.

A detailed history was taken and a careful clinical examination was performed. The laboratory investigations like haemoglobin (Hb), the total count and the differential leucocyte counts (TLC and DLC), platelet count, haematocrit (Hct), liver function tests (LFT), urea, creatinine, chest X-ray, Dengue IgM NS1 and ultrasonography of abdomen were done in all the patients. Other relevant investigations were performed according to the clinical condition of the patient. All patients were treated according to guidelines by National Vector Borne Control Programme.

Results:

Out of 126 patients 75 (59.5%) were male and 51 (40.4%) were female with male to female ratio of 1.4:1. Majority of them belonged to the age group of 6-9 years (53.9%). The majority of these cases were admitted in the rainy and winter season between the months of July and November. The least admission was seen in the summer season, specifically in the month of April, consisting of only 4 cases (4.1%). In our study all the patients had fever with 71 (60.1%) of them had fever lasting for more than 5 days. Other common symptoms were body ache (73%) followed by nausea, vomiting (49.2%), abdominal pain (42.8%), headache (42.2%) and retro orbital pain (25.3%), breathlessness (16.6%), and oliguria (13.49%). Amongst the signs, most common was tachycardia followed by, hepatomegaly (21.9%), pleural effusion (21%) skin rash (18.2%) and hypotension (17%), ascites (15.8%), positive tourniquet test (11.9%), Oedema (11.6%), jaundice (6.6%). The most common bleeding manifestations were petechiae (22.1%). In our study, bradycardia was seen as the early sign

of myocarditis in most patients having the same which was not seen in the previous studies^{4,5,6}. On investigation, leucopenia was seen in 43.5% of patients and thrombocytopenia were seen in 90.4% of patients, however leucopenia was seen earlier than thrombocytopenia and in more number of patients in the disease course. Among the liver enzymes, SGOT was elevated in a larger proportion (47.42%) of patients when compared to alanine aminotransferase (SGPT) (30.92%) and was more specific marker for dengue. Maximum patients had platelet in the range of 50,000-100000 (33.2%), followed by platelet count of 20,000-50,000 (30.3%). Parameters like prothrombin time (PT) and activated partial thromboplastin time (aPTT) were abnormal in 19 (15%) patients and was carried out only in those who had signs of bleeding (22.1%). One of the important findings of dengue was raised haematocrit which was seen in 34.02% of the cases. 55.5% patients tested positive for dengue IgM and 44.4% of them for NS1Ag. Tourniquet test was found to be negative in the majority of patients (Only 11.9% were positive). 14.2% of patients had elevated CPK MB and (9.5%) of them had elevated troponin-I levels. ECG changes in form of either prolonged QT interval or low voltage waves were seen in all patients with myocarditis (14.2%). Most common USG finding seen in the study was pleural effusion in 26.4% cases. Other findings were hepatomegaly (21.9%), gall bladder edema (15.3%). Most common complication seen in the study was hepatitis (20.6%) followed by myocarditis (14.2%), dengue shock(11.1%) encephalitis (4.7%), dengue haemorrhagic fever (4.7%) and ARDS(2.3%). Fluid accumulation in the form of pleural effusion (26.9%) ascites (15.8%), oedema(11.6%) were seen. Right sided effusion (20.6%) was most commonly seen followed by bilateral effusion (6.18%). During this study period coinfections were more seen in form of malaria (9.12%), enteric fever (5.39%), hepatitis (2.48%), UTI (3.73%). Among 126 patients, 119(94.4%) of the cases needed intravenous fluids. Dopamine was required in 11 (8.7%). Platelet concentrate was required in 13 patients in severe dengue cases; FFP was given to 19(15%) patients, PCV to 11 patients. In our study 120 patients recovered and 6 patients (4.7%) expired. The causes of mortality were complications in form of ARDS, Encephalitis, dengue shock syndrome and Dengue haemorrhagic fever.

Table 1: Symptoms at the time of presentation

Symptom	Percentage
Fever	100%
Duration >5 days	76(60.31%)
Duration <5 days	50(39.69%)
Bodyache	92(73%)
Nausea/Vomiting	62(49.2%)
Headache	52(42.2%)
Abdominal pain	54(42.8%)
Retro orbital pain	32(25.3%)
Altered sensorium (drowsy/stupor/coma)	6(4.7%)
Breathlessness	20(16.6%)
Oliguria	17(13.49%)

Almost all patients presented with generalised symptoms such as fever, nausea, vomiting and body ache, very few presented with retro-orbital pain, altered sensorium or oliguria.

Table 2: Clinical signs

Sign	Percentage
Tachycardia	46(36.5%)
Hepatomegaly	27(21.5%)
Pleural effusion	26(21%)
Skin rash/Petechiae	23(18.2%)
Hypotension	21(17%)
Ascites	20(15.8%)
Bradycardia	18(14.2%)
Oedema	15(11.6%)
Jaundice	8(6.6%)

Tachycardia and hepatomegaly were among the most common signs but relatively higher percentage of patients had bradycardia not reported previously^{4,5,6}.

Table 3: Complications

Complications	Percentage
Hepatitis	26(20.6%)
Myocarditis	18(14.2%)
Dengue shock	14(11.1%)
Encephalitis	6(4.7%)
Dengue Haemorrhagic fever	6(4.7%)
ARDS	3(2.3%)

Hepatitis was amongst the most common complication.

Table 4: Laboratory parameters

Parameters	Percentage
Thrombocytopenia	90.4%
Raised SGOT	47.4%
Raised SGPT	30.9%
Leucopenia	43.7%
Altered CPK-MB	14.2%
Raised troponin-I	9.5%
Abnormal ECG(low voltage/prolonged QT)	14.2%

Discussion:

Dengue is emerging as a major health problem in India. In the present outbreak, dengue cases showed a male to female preponderance as 1.4:1 respectively. Covered dress used by females along with less health care approach may be one of the cause for fewer incidences. Congruent pattern was also seen in the Tiple et al(1.1:1)⁶ Hema et al(1.3:1)⁴. Duration of hospitalisation was more in case of severe dengue patients. But delay in hospitalisation did not predict the severity in our study. The clinical profile of dengue

revealed that fever was the most common presenting symptom seen in all patients (100%). Body ache was seen in (73%) of the patients followed by vomiting (49.2%), abdominal pain (42.8%), headache (41.2%) and retro orbital pain (25.3%) Breathlessness (16.6%), oliguria(13.49%). This goes with previous study of Hema et al⁴ and Tiple et al⁶ study. Most common sign was found to be tachycardia(36.5%) followed by, hepatomegaly(21.9%),pleural effusion(21%),skin rash(18.2%) and hypotension(17%) ascites (15.8%).Positive tourniquet test were seen in only 11.9% as opposed to Hema et al⁴ study having 33.3% positive cases .There were increased incidences of fluid accumulation in form of pleural effusion(26.9%),ascites(15.8%),oedema(11.6%) which was not seen previously^{4,5,6}. Bradycardia was seen as the early sign of myocarditis which was not seen in the previous studies^{4,5,6} along with simultaneously raised CPK-MB levels and ECG changes. SGOT was also elevated in all patients having myocarditis. The most common bleeding manifestations in both severe and non severe dengue were petechiae, purpura, and ecchymosis that goes with previous studies^{4,5,6}. Gastrointestinal bleeding was significantly seen in severe dengue cases. Two patients in the severe dengue group had convulsion due to encephalitis. In our study thrombocytopenia was seen in 90% patients and Leucopenia in 43%. Arul Kumar et al⁵ showed thrombocytopenia (96%) and Leucopenia (38%) i.e. more percentage of Leucopenia was seen as. Elevation of SGOT was significantly more compared to SGPT in the present study as compared to Amrita et. al⁸ that showed almost equal percentage of rising SGPT and SGOT. R kumar et al⁹ had similar findings and it was found in our study that raised levels were associated more with severity of infection and could be used as a significant pointer of the same . Very high levels of SGOT and SGPT indicate severity of the disease along with morbidity and mortality^{9,10} . Rise in PT/aPTT also depicts severity of disease and was seen in 15% of the patients. 14.2% of patients had elevated CPK MB and 9.5% of them had elevated troponin-I. Associated coinfections in form of malaria (9.12%), enteric fever (5.39%) hepatitis (2.48%), UTI(3.73%) were seen similar to previous study⁴.Complications were less compared to Tiple et al⁶ and more compared to Hema et al⁴ Selvan et al¹⁰.In our study 120 dengue cases recovered There was less mortality in the present study group, may be to due to increasing awareness and early seeking of medical attention and improved health services.

Conclusion:

Dengue is a common and one of the dreaded fevers for the paediatric age group. All the patients were treated symptomatically and 120(95.2%) improved with 6 expiries. In our study we have enlisted all the typical and atypical presentations, epidemiological data, investigations . Myocarditis with bradycardia as its manifestation and other complications were found to be increased in our studies. In the recent few years, the world has seen varied clinical presentations of the dengue fever in different epidemics, even in the same regions and even in the same period of time. Where some known features are still manifesting, few atypical features are noted from several parts of the world as seen in our study. So a continuous sero-epidemiological surveillance and timely interventions are needed to identify the cases, so that its complications and mortality can be minimised.

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