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Clinical profile of dengue fever in children admitted in a district hospital of South India

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ABSTRACT

Background: To assess the clinical profile of dengue fever in children.

Methods: In this Prospective observational study 110 patients who admitted in Government District Headquarters Hospital, Namakkal between 1st August 2019 to 31st December 2019 were included. Those patients with confirmed dengue, with IgM dengue antibody positive were included in this study. Detailed history was taken, and clinical examination was performed, and laboratory investigations were done.

Results: In this study 110 patients were studied, majority were males. Fever was present in 100% of patients followed by headache, myalgia. The common signs and symptoms of dengue infection were fever, headache, body ache, retro-orbital pain, bleeding manifestations, and rash in 100%, 97.27%, 92.72%, 77.27%, 8.12%, and 60.90%, respectively. In 90 cases platelet count was less than 100,000/cumm of which bleeding manifestation was found in 9 patients. Pleural effusion and ascites were observed in 25 and 15 cases respectively. Hepatomegaly was noted in 19 cases and splenomegaly in 10. Leucopenia was present in 52 cases whereas raised liver enzymes were present in 51 cases. The mortality rate was 0.9%.

Conclusions: Dengue epidemic has increased in recent past probably due to unplanned urbanization with rapid construction activities, unhygienic condition and poor sanitation facilities contributing fertile breeding soil for mosquitoes. Early diagnosis and management can decrease mortality and morbidity of illness. Platelet transfusions have little role in management of dengue patients.

Keywords: Children, Clinical profile, Dengue fever, Diagnosis

INTRODUCTION

Dengue is the most common arthropod-borne viral (arboviral) illness in humans. The incidence has increased manifold in India due to unplanned urbanization and migration of population to urban areas. Although initially reported from urban locales, dengue is now being reported from urban and rural backgrounds alike. Dengue is caused by infection with one of the four serotypes of dengue virus, which is a Flavivirus. Infection with one dengue serotype confers lifelong homotypic immunity to that serotype and a very brief period of partial heterotypic immunity to other serotypes, but a person can eventually be infected by all 4 serotypes. Several serotypes can be

in circulation during an epidemic. Dengue is transmitted by mosquitoes of the genus Aedes, principally Aedes aegypti.² In India the annual incidence is estimated to be 7.5 to 32.5 million.³

Initial dengue infection may be asymptomatic (50-90%), may result in a nonspecific febrile illness, or may produce the symptom complex of classic Dengue Fever (DF). Classic dengue fever is marked by rapid onset of high fever, headache, retro-orbital pain, diffuse body pain (both muscle and bone), weakness, vomiting, sore throat, altered taste sensation, and a centrifugal maculopapular rash, among other manifestations. A small percentage of persons who have previously been infected by one

dengue serotype develop bleeding and endothelial leak upon infection with another dengue serotype. Dengue reinfection is observed to be more severe in children due to immunological phenomenon.⁴ This syndrome is termed Dengue Hemorrhagic Fever (DHF). The exact clinical profile is crucial for diagnosis as well as successful management of the patients. Infection with one dengue serotype confers lifelong homotypic immunity to that serotype and a very brief period of partial heterotypic immunity to other serotypes, but a person can eventually be infected by all 4 serotypes. Increase i n the number of dengue cases over the past few years has been attributed to rapid unplanned urbanization with unchecked construction activities and poor sanitation facilities contributing fertile breeding areas for mosquitoes, it is also seen that increase in alertness among medical personnel following the epidemics and availability of diagnostic tools in the hospitals have contributed to the increased detection of cases.5 This study is an attempt to elucidate the clinical profile of serologically confirmed cases of dengue fever in hospital.

METHODS

In this Prospective observational study 110 patients who admitted in Government District Headquarters Hospital, Namakkal between 1st August 2019 to 31st December 2019 were included. Those patients with confirmed dengue, with IgM dengue antibody positive between age group of 2 months to 12 years were included in this study.

Those patients with concomitant malaria, typhoid, leptospirosis etc. were not included in study. Detailed history was taken, and clinical examination was performed, and laboratory investigations were done after explaining the nature of study and informed written consent taken from the cases. Routine investigation like hemoglobin, TLC and DLC, platelet count, hematocrit, liver function tests, blood urea and serum creatinine, chest radiograph and ultrasound scan of abdomen were done whereas specific investigation were advised wherever indicated to rule out other differential diagnosis.

Inclusion criteria

Patients who admitted in Government District Headquarters Hospital, Namakkal between 1st August 2019 to 31st December 2019 with acute febrile illness and two or more of the following manifestations: headache, retro-orbital pain, myalgia, arthralgia, rash, haemorrhagic manifestations and leucopenia were included. Those patients with confirmed dengue, with IgM dengue antibody positive between age group of 2 months to 12 years were included in this study.

Exclusion criteria

 Patients who admitted with acute febrile illness and IgM dengue antibody negative were excluded. Those patients with concomitant malaria, typhoid, leptospirosis etc. were not included in study.

RESULTS

110 cases were reported between 1st August 2019 to 31st Dec 2019 and majority of these were reported in rainy season showing the breeding of mosquitoes during the said period. Month wise reported cases were shown in table 1. Out of 110, majority 62(56.36%) were male and 48(43.63%) were females (Table 2). Out of the 110 cases reported 72(65.45%) were from rural areas and 38(34.54%) were from urban areas (Table 3).

Table 1: Month wise cases reported.

Month	Number of cases (%)	
August	10(9.09)	
September	15(13.63)	
October	29(26.36)	
November	30(27.27)	
December	26(23.63)	

Table 2: Sex wise cases reported.

Sex	Number (%)
Male	62(56.36)
Female	48(43.63)

Table 3: Area wise cases reported.

Area	Number (%)
Rural	72(65.45)
Urban	38(34.54)

Fever was present in all cases (100%). Headache, Retro orbital pain, Myalgia, Abdominal pain, Nausea/ Vomiting Diarrhea were observed in 107(97.27%), 85(77.27%), 102(92.72%), 40(36.36%), 22(20.00 %) and 12(10.90 %) cases respectively. Skin rash and Itching were noted in 67(60.90) and 52(47.27) cases respectively. Bleeding, Pleural effusion, Ascites, Breathlessness and Seizures were present in 9(8.18%), 25(22.72%), 3(2.72%) 15(13.63%), 8(7.27%) and cases. Hepatomegaly and Splenomegaly were seen in 19(17.27%) and 10(9.09%) cases. On laboratory studies Thrombocytopenia (<1, 00,000/cu.mm), Leucopenia (WBC <4000/ cu.mm), Raised ALT/AST and Raised HCT were observed in 90(81.81%), 52(47.27%), 22(20.00%) and 51(46.36%) cases respectively (Table 4).

All the patients were managed with careful monitoring of blood pressure, hematocrit, platelet counts on as and when required basis. Antipyretics (Paracetamol) were used along with intravenous fluids (normal saline and ringer lactate) on as required basis. Whole blood transfusions were used in 15 patients when platelets were below 20,000/cumm and patients had evidence of bleed. Platelet transfusions were not used in any of the patients.

Only one patient died due to late referral with refractory shock with mortality rate of 0.9%).

Table 4: Clinical manifestations.

Manifestations	Numbers (%)
Fever	110(100)
Headache	107(97.27)
Retro orbital pain	85(77.27)
Myalgia	102(92.72)
Abdominal pain	40(36.36)
Nausea / Vomiting	22(20.00)
Diarrhea	12(10.90)
Skin rash	67(60.90)
Itching	52(47.27)
Bleeding	9(8.18)
Pleural effusion	25(22.72)
Ascites	15(13.63)
Breathlessness	8(7.27)
Seizures	3(2.72)
Hepatomegaly	19(17.27)
Splenomegaly	10(9.09)
Thrombocytopenia (<1,00,000/cu.mm)	90(81.81)
Leucopenia (WBC <4000/ cu.mm)	52(47.27)
Raised ALT/AST	22(20.00)
Raised HCT	51(46.36)

DISCUSSION

Increase in the number of dengue cases over the past few years has been attributed to rapid unplanned urbanization with unchecked construction activities and poor sanitation facilities contributing fertile breeding areas for mosquitoes, it is also seen that increase in alertness among medical personnel following the epidemics and availability of diagnostic tools in the hospitals have contributed to the increased detection of cases.⁵ Dengue is one of the important arboviral infection in tropical countries. Global incidence of dengue fever has increased significantly in the recent decades.⁶ Moreover, there is increase in awareness in medical practitioners following the epidemics with availability of diagnostic tools in the hospitals have contributed to the increased detection of cases. Dengue has now become an expected postmonsoon phenomenon in many parts of India.^{7,8} The hyperendemicity with two or more serotypes during the same time period have been widely recognized as important cause of disease severity in India. 9,10 Release of cytokines and stimulation of immunologic mechanism caused by interaction between dengue virus and host cell leading to vascular endothelial damage, recruitment of mononuclear cells and perivascular edema.

It was noteworthy to find out the difference in male: female dengue case ratio in this study. This might be probably due to more male children playing in outfields in the India. Covered dress worn by female children might be other explanation for having fewer incidences of

dengue in female. Higher incidence of dengue in rainy season is attributed to fact that it is breeding season of mosquitoes. ¹¹ In this study fever was present in all cases. Headache, myalgia, abdominal pain, vomiting, retro orbital pain, and abdominal distension were seen commonly. The most common bleeding manifestations in both severe and non-severe dengue were petechiae, purpura, and ecchymosis. Malena was the most common bleeding manifestation reported in this study. There was no correlation between platelet counts and bleeding manifestations in this study. Various factors apart from thrombocytopenia lead to bleeding in dengue. They are decreased platelet function, fibrinogen consumption and prolongation of PT/PTT and vasculopathy. ¹²

Headache and retro-orbital pain are well-known features of dengue fever. In present study authors found that 97.27% of patients had headache as chief complaint and 77.27% had typical retro-orbital pain. In study by Mandal et al, 62.16% patients presented with headache. ¹³ In some studies like Itoda et al, 90% of patients presented with headache. ¹⁴

With technological advancements like ultrasonography, more and more cases of dengue fever are being reported with ascites and pleural effusion, but it is to be done at right time. Authors have detected third space collection in form of ascites in 13.63% and pleural effusion in 22.72% of patients. In a study by Mandal et al, ascites was present in 8.1% and pleural effusion in 18.9% of cases. ¹³ In Bangladesh based study by Mia et al, 42% had pleural effusion and 41% of patients developed ascites. ¹⁵ In ultrasound based study by Kalayanarooj et al, pleural effusion was diagnosed in 18%. ¹⁶

In the present study, 81.81% of patients had platelet count <1 lakh. Singh et al, observed thrombocytopenia in 61.39% of cases. ¹⁷ In a study by Mandal et al, 37.8% had platelet count below 50,000 per cubic mm and 13.51% had hemorrhagic manifestations in the form of melena and gum bleeding. ¹³ In a study by Tripathi et al, only 12.8% had platelet count <70,000 but 28% cases had hematemesis, 26% had melena, and 14.28% had epistaxis. ¹⁸ In a Hyderabad based study by Khan et al, only 5% of patients had bleeding while 40% had thrombocytopenia. ¹⁹

Low leucocyte count may be due to virus-induced inhibition of myeloid progenitor cells or due to destruction. Authors found that 47.27% had leucocyte count <4000 whereas study by Itoda et al, in which leucopenia was observed in 71% of cases. ¹⁴ Ageep et al, detected leucopenia in 90% of cases while Mandal et al, found leucopenia in 29.73% of cases. ^{13,20}

CONCLUSION

Dengue epidemic has increased in recent past probably due to unplanned urbanization with rapid construction activities, unhygienic condition and poor sanitation facilities contributing fertile breeding soil for mosquitoes. Dengue is a challenging disease with multisystemic, varied, atypical, and sometimes life-threatening presentations. Awareness of the manifestations goes a long way in early recognition, correct diagnosis, prompt intervention, and appropriate treatment. Early diagnosis and management can decrease mortality and morbidity of illness.

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