Journal of Cardiovascular Disease Research

ISSN:0975 -3583,0976-2833 VOL06, ISSUE 04, 2015

CLINICAL STUDY OF DENGUE FEVER IN CHILDREN

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ABSTRACT

Background: Dengue infections vary in severity, ranging from influenza like self-limiting illness to life threatening dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS). Present study was aimed to study dengue fever in 1-12 years age group at a tertiary hospital.

Keywords:

Dengue, children, NS 1 Antigen, platelet count, had dengue hemorrhagic fever, dengue shock syndrome.

INTRODUCTION

Dengue viruses (DV) occur as four antigenically related but distinct serotypes transmitted to humans by Aedes aegypti mosquitoes. These viruses generally cause either a benign syndrome, dengue fever (DF), or a severe capillary leakage syndrome, dengue haemorrhagic fever/dengue shock syndrome (DHF/DSS).[1] Dengue infections vary in severity, ranging from influenza like self-limiting illness to life threatening dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS) which, if left untreated, are associated with mortality as high as 20%.[2] Ranging from mild undifferentiated fever to severe shock, dengue illnesses have wide spectrum of clinical presentations. Clinical manifestations are variable in adults and children. Children in addition to normal signs and symptoms (High grade fever, myalgia, headache, and vomiting, retro bulbar pain) present with epistaxis, melena and Hepatomegaly. More cases of DHF are reported from children than adults. Dengue remains as puzzling disease in many aspects such as virus - host relationship and clinical expression variability.[3]

In dengue, complications such as plasma leakage, hemorrhage, and organ impairment are prevented by early case detection which can be done by clinical suspicion with laboratory evidence and early treatment. With early recognition and prompt treatment, dengue-related morbidity and mortality can be reduced.[4] Present study was aimed to study dengue fever in 1-12 years age group.

MATERIAL AND METHODS

Present study was single-center, observational, cross sectional study, conducted in Department of Pediatrics, Yenepoya Medical College, Mangalore.

. Study duration was of 2 years (July 2013 to June 2015).

Inclusion criteria

- Children (1-12 years age) with serologically confirmed (either with positive NS1 antigen or IgM/IgG antibodies by rapid serology test kit or ELISA) dengue admitted to the paediatric ward.

ISSN:0975 -3583,0976-2833 VOL06, ISSUE 04, 2015

Exclusion criteria

- Cases confirmed as malaria, typhoid, chikungunya and other causes
- Patients without parental consent

Informed and written consent was obtained from the parents/guardian of all patients included in the study after explanation.

All the probable cases with high-grade fever, rash, lymphadenopathy, hepatomegaly, feature of shock, or hemorrhage were admitted with a provisional diagnosis of dengue to the paediatric ward. The demographic, clinical profile, clinical findings, sign of plasma leakage (pleural effusion, ascites, raised haematocrit, bleeding, hypovolemic shock, and thrombocytopenia) and laboratory tests (complete hemogram with haematocrit and platelets, total count, and serum glutamic-pyruvic transaminase) were noted.

Blood parameters Hb%, total platelet count (TPC), haematocrit, hemogram, Prothrombin time (PT), activated partial thrombin time (aPTT), Total lymphocyte count (TLC), liver function test were monitored every day until a remarkable improvement was seen clinically and hematologically. Ultrasonography of abdomen, chest X-ray were done in cases where required. The enrolled cases were classified based on the WHO guidelines as severe dengue fever which included dengue haemorrhagic fever (DHF) and dengue shock syndrome (DSS), non-severe dengue (with or without warning signs) and undifferentiated fever. The patients were treated as per WHO guidelines by paracetamol, inotropes, I.V. fluids and whole blood, platelet transfusions where required. Outcomes of patients were recorded. Data was collected and compiled using Microsoft Excel, analysed using SPSS 23.0 version. Statistical analysis was done using descriptive statistics.

RESULTS

Table 1: General parameters

Parameter	Number of cases (n=135)
Age (years)	
1-3	21
4–7	28
8–11	31
11-12	55
Mean age (years)	8.7
Gender	
Male	89
Female	46
Duration of hospitalization (days)	
0–3	45
4–6	77
>6	13
Mean duration of hospitalization (days)	3.8

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Table 2- Dengue according to severity

Dengue according to severity	Number of cases (n=135)
Dengue Fever	82
Severe dengue (DHF +DSS)	53
DHF	42
DSS	11

Table 3: Clinical profile of dengue

Symptoms	Number of cases (n=135)
Fever	135
Headache	102
Vomiting	95
Abdominal pain	91
Retro-orbital pain	68
Nausea	59
Joint pain	25
Difficulty in respiration	13
Signs	
Pallor (%)	53
Rash	39
Hepatomegaly	35
Icterus (%)	21
Petechiae/purpura/ecchymosis	21
Abdominal distension	17
Splenomegaly	6
Lymphadenopathy	2
Impaired consciousness	2

Table 4: Serological profile of children with dengue.

Parameter	
Dengue Serology	
IGM +ve	16.30%
NS 1 Ag +ve	48.15%
Both IGG & IGM +ve	31.85%
IGG +ve	8.15%
Platelet count	
≤20,000/mm3	0.74%
20,000–50,000/mm3	6.67%

ISSN:0975 -3583,0976-2833 VOL06, ISSUE 04, 2015

50,000–100,000/mm3	27.41%
100,000–150,000/mm3	33.33%
>150,000/mm3	31.85%
Other	
Deranged LFT's	15.56%
Deranged RFT's	9.63%
Deranged Coagulation profile	3.70%

Table 4: Management of patients.

Management	Number of cases (n=135)
Antipyretics	135
I. V. fluids	105
Platelet transfusion	8
Whole blood transfusion	5
Dopamine	5
Other	
Children required who Mechanical ventilation	7
Children who needed blood products	13
Developed AKI	3
Case Fatality	2

DISCUSSION

Several factors may influence disease severity, including host factors, virus serotype or genotype, sequence of virus infection, differences in dengue cross-reactive antibody, and T-cell responses.[5] DF is usually self-limiting, and death is uncommon. However, age-related differences in dengue severity are poorly understood and data on clinical features in adult patients are limited.[6] Although shock and plasma leakage seem to be more prevalent in younger patients, the frequency of internal haemorrhage augments as age increases.[7] Furthermore, complications of dengue infection observed in adults, including DF with unusual bleeding and DHF, have been increasing.[8] DHF can be distinguished from DF by the presence of increased vascular permeability (plasma leakage syndrome) and marked thrombocytopenia (,100,000/ml) associated with bleeding, hepatomegaly and/or abnormal liver function.[2] Although children are more likely to develop hypovolaemic shock characterized by increased microvascular permeability in DHF, a high mortality rate has been observed in adult patients.[9] In WHO manual, it was highlighted that, if untreated the fatality was 30 to 40% in patients with DSS.[10] It is worthwhile to note that the survival of dengue infected children is directly related to early and intensive management. Patients suffering from dengue fever with warning signs and severe dengue need hospitalization.[17] Patients with unstable hemodynamics, major bleeding, respiratory distress and organ failure are often admitted to critical care unit.[11] Organ dysfunction is a frequent complication in patients of

ISSN:0975 -3583,0976-2833 VOL06, ISSUE 04, 2015

severe dengue infection. There may be a single or in combination of 2 or more organ dysfunction. Severe organ impairment including hepatic failure, encephalitis or encephalopathy, acute renal failure and myocardial dysfunction is associated with high mortality even in the absence of plasma leakage and shock.[12] Disease severity, hyperlactatemia at admission, need for multiple vasoactive drugs and positive fluid balance are predictors of mortality in severe dengue infection in children admitted.

CONCLUSION

Majority children had NS 1 Ag +ve , platelet count was 100,000–150,000/mm^3 & managed with antipyretics, IV fluids only.

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