Research Article

Prevalence and severity of Thrombocytopenia in Dengue fever in children

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Abstract: Dengue is a major international health concern that is prevalent in tropical and sub-tropical countries. A hallmark of dengue fever is thrombocytopenia. The objective of the study was to assess the prevalence, severity of thrombocytopenia and its bleeding manifestations during current outbreak of dengue fever in children, which causes concern for the patients, treating doctors and the society. A Prospective study was conducted on all the laboratory confirmed cases of dengue fever during the outbreak of dengue fever from May 2015 to July 2015 among 300 children admitted to 4 major hospitals in Bangalore, Karnataka, India. The results of 300 patients studied, the prevalence of thrombocytopenia was 92%. Among these thrombocytopenic children, mild thrombocytopenia was seen in 32%, moderate thrombocytopenia was seen in 55.7% and severe thrombocytopenia in 11.5% of the cases. Among the gender and age majority of them were males 58% and in the age group of 6-10 years was 35.5%.Bleeding manifestations were noticed in 5.8% of the cases and majority of them with epitasis(2.5%).Mortality was nil in our study. This study concludes bleeding manifestations and severe thrombocytopenia are less inspite of high prevalence of thrombocytopenia in dengue fever during current outbreak. Community awareness, early diagnosis and management and vector control measures needed to be strengthened in order to reduce the increasing number of dengue cases.

Keywords: Dengue fever, mild thrombocytopenia, moderate thrombocytopenia, severe thrombocytopenia, bleeding manifestations.

INTRODUCTION

Dengue infection is a emerging disease and is a major health problem in our country. Globally the incidence of dengue has increased in the recent years. The WHO estimates that presently about two fifths of the world population is at risk for this viral infection [1]. Dengue fever was first reported by Benjamin Rush in 1780 as "break bone fever." It is a mosquito borne viral infection with four serotypes causing severe dengue fever, dengue with warning signs, and dengue without warning signs [2]. It is estimated that worldwide nearly 2.5 billion people continue to live at risk of contracting the infection while 50 million cases and 24,000 deaths tend to occur in 100 endemic countries. Recovery from infection by one serotype offers lasting immunity against that particular serotype, but subsequent infections by other serotypes increase the risk of developing severe dengue [3]. Risk of mortality in treated cases of is less than 1% while mortality rate among untreated cases escalates to 20% [4].

India is one of the seven countries in the South-East Asia region regularly reporting incidence of dengue outbreaks due to its high incidence which constantly threatens the health care system. The first confirmed case of dengue infection in India dates back to 1940s, and since then more and more new states have been reporting the disease which mostly strikes in epidemic proportions often inflicting heavy morbidity and mortality [5].

The normal range of platelet count is 150,000 to 450,000/mm^6 and counts less than 150,000/mm [6] are referred to as thrombocytopenia. Thrombocytopenia is a hall marker of dengue fever with bleeding manifestations, which causes concern for the patients and treating doctors. With the advances in medical research, it is now evident that activation of immune process and direct marrow suppression by the viral particles is responsible for decline in platelets [7] It has been proposed that platelets are sensitized by auto antibodies, and then are destroyed by the reticulo-endothelial system of the body. These auto antibodies against glycoproteins of the platelet membrane can be identified in 80% of the patients [8].

The aim of this study was to assess the prevalence, severity of thrombocytopenia and its bleeding manifestations in dengue fever in children.

MATERIAL AND METHODS

This hospital-based descriptive study with prospective data collection were carried out at the 4 major hospitals Sri Lakshmi Multispeciality Hospital, Narayana Superspeciality Hospital, Mallige Hospital, Maruti Hospital, Bangalore, Karnataka, India during the latest outbreak of dengue fever for a period of 3 months from May 2015 to July 2015. All the admitted patients were enrolled on a structural protocol which included symptoms, signs, diagnosis, complications, NS1 antigen, IgM, IgG dengue antibodies by ELISA technique, platelet count and other relevant investigations, treatment, duration of stay and outcome. Platelet counts were performed on whole blood of those individuals who were found seropositive for dengue infection. Platelet counts were performed using Automated Hematology Analyzer. Relevant data was entered in a proforma and analyzed. The diagnosis of dengue fever was based on the WHO criteria [3].

Inclusion criteria;

1. Children with age group of 0-18 years
2. Admitted with symptoms of dengue fever based on WHO criteria
3. NS1 antigen and IgM dengue antibody-positive cases by ELISA technique

Exclusion criteria;

1. Children with IgG dengue antibody positive
2. Children with malaria and enteric fever.

RESULTS

A total of 300 cases admitted to the 4 major hospitals in Bangalore during current outbreak from May 2015 to July 2015 were statistically analyzed. Among 300 patients studied, the prevalence of thrombocytopenia was 92%(276/300).With reference to the severity, mild thrombocytopenia was seen in 32%(90/276),moderate thrombocytopenia was seen in 55.7%(154/276) and severe thrombocytopenia in 11.5%(32/276) of the cases.

With reference to the sex, majority of the thrombocytopenia were seen in males with 58 %(160/276). Among different age groups, majority of the thrombocytopenia were observed in the age group of 6–10 years 35.5 %(98/276) followed by more than 10 years with 33.6% (93/276). With reference to the bleeding tendencies, 5.8 %(16/276) of the thrombocytonic children had bleeding from various sites among which epistaxis was the most common symptom with 2.5 %(7/276) followed by petechiae with 1.8 %(5/276).

Table 1: Age and sex pattern of thrombocytopenia

Age in years	Male	Female	No of Thrombocytopenia
0-1	3	2	5 (1.8%)
1-3	19	15	34 (12.3%)
3-6	30	20	50 (18.1%)
6-10	58	38	98 (35.5%)
10-18	50	43	93 (33.6%)
Total	160	116	276

Table 2: Bleeding manifestations of dengue fever

Bleeding manifestations	Number of Patients
Epistaxis	7 (2.5%)
Petechiae/Purpura	5 (1.8%)
Malaena	2 (0.72%)
Subconjunctival hemorrhage	2 (0.72%)
Total	16 (5.8%)

Table 3: Severity of thrombocytopenia of dengue fever

Severity of thrombocytopenia	Number of Patients
Mild	90
Moderate	154
Severe	32
Total	276

DISCUSSION

Dengue is a major international health concern that is prevalent in tropical and sub-tropical countries. The objective of the study was to assess the prevalence, severity of thrombocytopenia and its bleeding manifestations during current outbreak of dengue fever in children.

This study shows, the prevalence of thrombocytopenia was 92%. With reference to the age and sex majority of the cases were in the age group of

6-10 years with 35.5% followed by more than 10 years with 33.6%,and predominantly seen in male children with 58% of the cases and similar pattern was seen in study by Shankar et al[9,10]. This may be due to outdoor activities of these children, where chances of getting bitten with mosquitoes are more.

Among these thrombocytopenic children, mild to moderate thrombocytopenia was seen in 87.7% of the cases and similar pattern was seen in study by Shankar et al. [9]. Bleeding manifestations were noticed only in 5.8% of the cases, similar to the study by Buchanan GR et al. [11] and majority of them were presented with epistaxis(2.5%). Mortality was nil in our study similar pattern was seen in study by Shankar et al [9] indicating thrombocytopenia has no correlation to mortality and may be due to presence of less virulent strains during current outbreak.

CONCLUSION

This study concludes bleeding manifestations and severe thrombocytopenia are less inspite of the high prevalence of thrombocytopenia in dengue fever during current outbreak. Community awareness, early diagnosis and management and vector control measures need to be strengthened in order to reduce the increasing number of dengue cases.

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