e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2023; 15(12); 1639-1643

Original Research Article

Correlation of Bleeding to Platelet Level in Dengue Patients and its Clinical Spectrum in a Tertiary Care Hospital of Tripura

Subhradeep Pal[1], Subrata Bhowmik[2], Abir Bhowmik[3], Aiswarya J Vinod[4]

[1]Postgraduate trainee 3rd year, Department of Medicine, AGMC & GBP Hospital, Agartala, Tripura, India

[2]Assistant Professor, Department of Medicine, AGMC & GBP Hospital, Agartala, Tripura, India

[3]Postgraduate trainee 3rd year, Department of Medicine, AGMC & GBP Hospital, Agartala, Tripura, India

[4]Postgraduate trainee 2nd year, Department of Medicine, AGMC & GBP Hospital, Agartala, Tripura, India

Received: 25-10-2023 / Revised: 23-11-2023 / Accepted: 26-12-2023

Corresponding Author:Dr. Subrata Bhowmik

Conflict of interest: Nil

Abstract:

Introduction: Dengue is a vector borne disease by four differ enterotypes of dengue virus transmitted by bite of female Aedes mosquito. It is an acute febrile illness characterised by myalgia, joint pain, and gastrointestinal manifestations. Complications like dengue hemorrhagic fever(DHF) and Dengue shock syndrome(DSS), Extended Dengue Syndrome (EDS) may be fatal for patients. During the surge of dengue cases in Tripura in the months of July & August this study was done to analyse clinical spectrum of dengue in admitted patients.

Aims & Objectives: To study the clinical profile and correlation of bleeding to platelet level in dengue patients admitted in tertiary care hospital of Tripura.

Material & Methods: This was an Observational Cross-sectional study done during July & August month 2023. All patients with fever tested positive for NS1Ag/and IgMAb, admitted at dengue ward in AGMC & GBP Hospital were included in the study.

Results: A total of 160 patients admitted in hospital out of which 104 males & 56 were females. Maximum patients (27%) belong to the age group of 30-40years. The most common symptoms were fever (98%) & headache (55%), body ache (40%), pain abdomen (8.7%), vomiting (20%). The most common complications were black colour stool in 3.1% of patients. 35% of patients have platelets count between 50,000 to 1 lac and 92% of patients did not required platelets. 3% of patients have less than 20,000 & all of those patients have bleeding manifestations.

Conclusion: With the rise in incidence in dengue fever, this study brings the clinical profile and platelet counts corelation with bleeding. In this study there was a higher incidence of dengue seen in males of age group of 30-40 years. Proper health education and awareness about the fever, warning signs and early referral may prevent complications and deaths. Special preventive strategies should be planned during the monsoon period.

Keywords: Dengue, Fever, Mosquito.

Introduction

Dengue is a viral disease that is spread by mosquitoes. It is transmitted by mosquitoes of the species Aedes most commonly Aedes aegypti, and vaguely by Aedes albopictus. The causative agent of Dengue is a virus of the family Flaviviridae, but it has four serotypes that cause Dengue. They are DENV-1, DENV-2, DENV-3 and DENV-4. The clinical presentation of dengue can include a range from mild to severe. It can cause very mild fever up to fatal dengue hemorrhagic fever. [1,2]

Generally, in tropical and subtropical countries, outbreak of DF occurs after every 3–4 years. India has also encountered this outbreak every year for the last 10 years. It is the cause of arboviral infection across the world. There are some factors responsible for the emerging and re-emerging of DF such as the lack of hygiene, unorganized health care systems, lack of awareness, and increasing international travel. DF cases have been documented in 129 countries in the WHO's Africa, Americas, Southeast Asia, and Western Pacific regions. Globally, 390 million dengue infections are projected based on modelling data. [3,4]

The clinical manifestation of dengue infection ranges from asymptomatic to a wide range of symptoms, known as "dengue fever (DF)".

Symptoms of DF range from a mild flu-like syndrome to a severe form, dengue haemorrhagic fever (DHF). DHF is characterized by haemorrhagic manifestations such as spontaneous bleeding, significant decrease in platelet count and increased vascular permeability noted as increased hemo-concentration or pleural effusion or ascites. [5] DHF, if not timely managed, may progress to the life-threatening stage of hypovolemic shock, known as dengue shock syndrome (DSS). [6] DSS occurs at the time of or shortly after blood pressure drop, and is characterized by a rapid, weak pulse, narrow pulse pressure (≤20 mm Hg) or hypotension with cold, clammy skin in the early stage of shock. In the absence of a prompt and appropriate treatment, this may soon progress to more serious form of shock in which pulse and blood pressure become undetectable, resulting in death within 12 to 36 h after the onset of shock. [7]

During first 3 days of illness platelet count is normal. Thrombocytopenia begins during febrile phase and platelet count is progressively reduced during haemorrhagic illness. [8] As per WHO guidelines, thrombocytopenia can be used as simple diagnostic criteria for DHF. (9) The only accessory laboratory test which supports the diagnosis of dengue is platelet count and it can be roughly estimated by microscopy even in the peripheral laboratories. [10]

Because of its cost-effectiveness and greater sensitivity and specificity, the non-structural protein 1 (NS1) antigen and immunoglobulin M (IgM) antibody enzyme-linked immunosorbent assay (ELISA) is the primary diagnostic modality in endemic countries. [11]

A dengue virus vaccine named Dengvaxia® (CYD-TDV) [12] has been recently developed and is licensed in 20 countries, but with limited use. In the EU and the United States, Dengvaxia® has been approved for use by individuals living in endemic areas, aged 9–45 years and who had a previous dengue virus infection, i.e., prevention of secondary dengue infection. [13,14] In the absence of a specific antiviral treatment, the present management of dengue fever illness is primarily supportive. Currently, the standard care is limited to rest, and administration of antipyretics such as paracetamol when fever is too high. In addition, crystalloid fluids, for maintaining fluid electrolyte balance and colloids to increase intravascular volume along with blood and blood products in case of bleeding are used in the management of dengue infection. [7]

Our aim is to study the clinical profile and correlation of bleeding to platelet level in dengue patients admitted in tertiary care hospital of Tripura**.**

Materials & Methods:

Study population: All patients with fever admitted in dengue ward in AGMC &GBP Hospital.

Study sample: Patients who were serologically tested positive for dengue NS1Ag & ELISA IgM.

Study Type: Cross-sectional observational study.

Study duration: June -November 2023

Tools: Hospital recorded data collected and entered into a proforma, age, sex, clinical features, warning signs, investigations (platelet count, MPQBC, chest x-ray, ultrasonography) & management were noted from the files.

Inclusion criteria: All patients admitted with fever and tested positive for dengue NS1Ag & IgM antibody.

Exclusion criteria:

Patients with hemoglobinopathies, malaria, scrub typhus, enteric fever, tuberculosis, other viral illness, & less than 12 years of age were excluded.

Data was entered in Microsoft excel and analysis by SPSS software.

Results

A total of 160 patients admitted in hospital out of which 104 males & 56 were females.

Table 1:

Gender	No	Percent
Male	104	65
Female	56	35

13.7% of patients belong to age group less than 20 years, 20.6% between 20-30 years, 30-40 years 26.8%, 40-50 years 20%, 18.7% were more than 50 years.

Table 2:

Age (in Years)	Numbers (Out of 160)	Percent
Less Than 20	22	13.7
20 – 30	33	20.6
30 - 40	43	26.8
40 - 50	32	20
More Than 50	30	18.7

The most common symptoms were fever (98%) & headache 55%, body ache 40%, pain abdomen 8.7%, vomiting 20%, melaena 3.1%, loose stool 1.9%, cough 5%. The most common complications were black colour stool among 3.1% of patients.

Table 3:

Clinical Features	Numbers	Percent
Fever	157	98
Headache	88	55
Bodyache	64	40
Vomiting	32	20
Pain Abdomen	14	8.7
Cough	8	5
Melaena	5	3.1
Loose Stool	3	1.9

According to lab study 99% of the patients were tested positive for dengue NS1 ag. In 3% patients platelet was <20000,in 6.9% patients 20,000 to 50,000 ,35% patients between 50,000 to 1lac ,25% patients 1 lac to 1.5lacs, 30% were more than 1.5lacs.

Table 4:

Platelets Count	No.	Percent	Correlation With Bleeding	Percent
Less Than 20,000	5	3	5	100
20,000-50,000	11	6.9	4	36.3
50,000-1,00,000	56	35	0	0
1,00,000-1,50,000	40	25	0	0
More Than 1,50,000	48	30	0	0

All patients with platelets below 20,000, have bleeding manifestations & 36.3% of patients with platelet count between 20,000-50,000 have bleeding manifestations.

Table 5:

Transfusion Needed	No.	Percent
Yes	12	7.5
No	148	92.5

Treatments show 92.5% percentage of patients did not required any transfusion, & 7.5% of patients required transfusion.

Table 6:

Bleeding Manifestations	Numbers	Percent
Black stool	5	3.1
Petechial hemorrhage	2	1.2
Conjunctival congestion	1	0.6
Heavy menstrual bleed	0	0
Hematochezia	1	0.6
Epistaxis	0	0
Hematuria	0	0

Out of 100 patients 35 numbers of people have raised AST & ALT.

Discussion:

In our study the most common age group affected was 30-40 years, these finding was similar to the study of Mehta et al [15] and Deshwal et al [16] as they were the most active overall and tend to visit many places during the daytime. There was a male preponderance in our study as compared to findings of Mehta et al, [15] Gupta and Bansal[17] and Karoli et al [18] in North India and similar to the study done in Karnataka by Kumar et al [19] Ukey et al [20] and Deshwal et al [16] in central India.Dengue has diverse of clinical manifestations starting from simple fever to life threatening complications and severe encephalopathy too. In our series all patient presented with fever (98%), followed by myalgia (40%). Headache is also one of common presentation 55% but retro-orbital pain which is a classical feature of dengue was seen in very less number of cases which is much less than

other studies but similar to Kapoor et al. [21,22,23,24]Thrombocytopenia, the most common manifestation, was present in 70% cases and these findings are similar to the study done by Kumar et aland Mehta et al. [19,15].

In our study it was observed that most of the patient have platelet count between 50,000 to 1 lac & most of the patient with platelet below 20000 have bleeding manifestation which is similar to the study by Abhi Mishra et al. [25] 56% of patients with platelet count less than 50,000 had bleeding manifestations and no bleeding was seen in patients with platelet counts of more than 50,000 in our study. It was observed that 95.8% of patients with platelet counts between 20,000-50,000/cu.mm developed haemorrhage according to Sreenivasa et al, While Joshi et al, Sunil Gomber et al, and Dhooria et al, reported poor correlation between thrombocytopenia and bleeding manifestations. [26-29]

There were 9 cases (5.6%) who presented with any form of bleeding manifestations in our study. However, Melena was found in 3.1% cases. Bleeding from other sites like hematochezia 0.6%, Ophthalmic Bleeding like conjunctival congestion was observed only in very less cases.

Sreenivas et al, found that 26% of cases had melaena, 20% had petechiae, 8% had haematemesis, 4% had epistaxis and 2% had gum bleeding. [26] Hematuria was the least common finding among our patients, it was reported the same in the earlier studies of Sreenivasan et al, Narayanan et al, that bleeding by the urogenital tract is less common among the bleeding manifestations. [24,26,30]

In our study, only 7.5% patients required platelet transfusion whereas in the study of Khan et al [31] 31% patients required platelet transfusion. Platelet count used to drop after 3-4 days of infection. It is very important to monitor the warning signs to combat the complications. Only 3% of the patients had platelet count less than 20,000, & all of them had bleeding manifestations. Only 7.5% of the patients required platelet transfusion.

Conclusion:

With the rise in incidence in dengue fever, this study brings the clinical profile and platelet counts correlation with bleeding. In this study there was a higher incidence of dengue seen in males of age group of 30-40 years. Proper health education and awareness about the fever, warning signs and early referral may prevent complications and deaths. Special preventive strategies should be planned during the monsoon period.

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