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Medicine

Study of the Relative Frequency of Different Disease in Fever with Thrombocytopenia

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Abstract	Original Research Article

Background: Thrombocytopenia is a common biological sign, and in severe situations, bleeding can ensue. Thrombocytopenia caused mostly by platelet immunological destruction, decreased platelet synthesis in bone marrow, and a delay in megakaryocyte maturation. Dengue fever haemostasis disruption is exacerbated by thrombocytopenia and platelet dysfunction. **Objective:** To determine the relative prevalence of various diseases in fever with thrombocytopenia. **Materials and Methods:** This observational, cross-sectional study was carried out by the Department of Medicine at the 100-bed district hospital in Narsingdi between July 2021 and June 2022. Total 100 adult patients (over the age of 18) who had thrombocytopenia and presented with fever were included in this study. We excluded patients who had a fever but no thrombocytopenia. Additionally, patients with thrombocytopenia but no fever were excluded from the research. **Results:** Malaria was the most prevalent cause of fever (44.0%), followed by dengue (27.0%), viral fever (18.0%), enteric fever (5.0%), dengue + malaria (3.0%), septicemia (2.0%), and hematologic malignancy (1.0%). **Conclusion:** Dengue fever and malaria are common causes of fever with thrombocytopenia because of seasonal and regional variations.
Keyword: Thrombocytopenia, Dengue, Infections, Platelets, Seasonal variation.

INTRODUCTION

Fever is a symptom which is caused by a variety of illnesses and it usually occurs in response to an infection or inflammation. Patients presenting with fever in tropical country like Bangladesh usually have an infectious etiology and many have associated thrombocytopenia [1].

Thrombocytopenia is defined as a platelet count less than normal range usually below 1, 50,000 per microlitre [2]. Fever is produced due to production of substances called pyrogen. Pyrogen acts by stimulating the synthesis of prostaglandins which is secreted in the vascular and perivascular cells of the hypothalamus.

Thrombocytopenia cases are considered mild if counts are between 60,000 and 1.5 lakh, moderate if counts are between 20,000 and 60,000, and severe if less than 20,000 per microlitre. Patients with platelet count less than 10,000/microlitre have increased risk of spontaneous bleeding, petechiae and bruising [3]. At times, the fever course is prolonged and fever with thrombocytopenia narrows the differential diagnosis of the clinical entity. Septicemia, infections like malaria, dengue, leptospirosis, typhoid, human immunodeficiency virus (HIV) and miliary tuberculosis are some of the common causes of fever with thrombocytopenia [4]. The purpose of the study, to carried out with an awareness of causes of fever with thrombocytopenia can shorten the duration of investigations and bring out the diagnosis.

METHODOLOGY

This was an observational, cross sectional study conducted by Department of Medicine at 100 bedded

district hospital, Narsingdi during the study period was from July 2021 to June 2022. This study was carried out in 100 adult patients (age above 18 years) presenting with fever having thrombocytopenia (platelet count <1,50,000/ mm^3) were included in this study. Patients with fever and no thrombocytopenia were excluded. Patients with thrombocytopenia and no fever were also excluded from study. Previously diagnosed conditions which can lead to thrombocytopenia such as ITP, cirrhosis, chronic liver disease, patients on drugs (aminosalicylic acid, Linezolid, Amiodarone Carbamazepine, Captopril, Methyldopa) causing thrombocytopenia were excluded. Detailed history was taken. Presenting complaints and haemorrhagic manifestation were noted. The bleeding manifestations that the patients presented with or developed during their course in hospital were recorded. All the patients were subjected to routine haematological investigation like haemoglobin, total leukocyte count, platelet count, peripheral smear study, peripheral smear for malarial parasites, MCV (mean corpuscular volume), Dengue NS1antigen, Dengue IgM and IgG, Prothrombin time with INR, Activated partial thromboplastin time, renal function test and liver function test. Baseline platelet counts were done on the day of presentation. Repeat platelet counts were done in subjects with marked thrombocytopenia until normal or near-normal values

were reached. Other investigations as necessary were done to achieve diagnosis such as bone marrow trephine biopsy, serological study for HIV infection, TSH, S. Widal, D-Dimer, Serum vitamin B12 level, Anti - Nuclear Antibody (ANA).

RESULT
Table 1 shows that majority (27.0%) patients were belonged to age 21-30 years. Almost two third (64.0%) were male and 36(36.0%) were female. Table 2 shows that malaria was the commonest cause of fever (44.0%) followed by dengue 27(27.0%), viral fever 18(18.0%), enteric fever 5(5.0%), dengue+ malaria 3(3.0%), septicemia 2(2.0%) and hematologic malignancy 1(1.0%). Table 3 shows that 62(62.0%) patients had platelet count >50000/mm^3, 30(30.0%) had platelet count 20000-50000/mm^3 and 8(8.0%) patients had platelet count <20000/ mm^3. In platelet count <20000/ mm^3, 4 patients had dengue, 2 patients had malaria, 1 patient had viral fever and 1 patient had dengue+ malaria (Table-4). Total 5 patients showed bleeding manifestations. Petechiae were seen in 12 patients as a major bleeding manifestation followed by 8 patients having gum bleeding, 5 patients had melena, 4 patients had hematuria and menorrhagia.

Table 1: Demographic profile of the study population

	Number of patients	Percentage
Age (years)		
≤20	22	22.0
21-30	27	27.0
31-40	24	24.0
41-50	18	18.0
>50	9	9.0
Sex		
Male	64	64.0
Female	36	36.0

Table 2: Cause of disease of the study population

	Number of patients	Percentage
Dengue	27	27.0
Malaria	44	44.0
Viral fever other than dengue	18	18.0
Enteric fever	05	5.0
Dengue+ Malaria	03	3.0
Septicemia	02	2.0
Hematologic malignancy	01	1.0

Table 3: Platelet count of the study population

Platelet count (/mm^3)	Number of patients	Percentage
<20000	08	08.0
20000-50000	30	30.0
>50000	62	62.0

Table 4: Association between fever with platelet count

	Platelet count <20000	Platelet count 20000-50000	Platelet count >50000
Dengue	4	10	13
Malaria	2	15	27
Viral fever other than dengue	1	2	15
Enteric fever	0	1	4
Dengue+ Malaria	1	2	0
Septicemia	0	0	2
Hematologic malignancy	0	0	1

Table 5: Association between sites of bleeding with platelet count

	Total	Platelet count <20000	Platelet count 20000-50000	Platelet count >50000
Petechiae/ecchymosis	**12**	2	9	1
Gum bleeding	**8**	1	7	0
Hematuria	**4**	0	3	1
Menorrhagia	**4**	0	4	0
Melena	**5**	4	1	0
Epistaxis	**2**	0	2	0
No bleeding	**65**	1	4	60

DISCUSSION

In this study that majority (27.0%) patients were belonged to age 21-30 years. Almost two third (64.0%) were male and 36(36.0%) were female. Meena *et al.,* [5] study found similar observation majority of case having dengue infection belong to the age group of 21-30 year (29%). 63cases (63%) were males and 37 (37%) were females. Observations made by Fazal and Biradar showed that majority of patients i.e., 30% were in age group of 21-30 years which is almost similar to the present study [6]. Singh *et al.,* [7] also showed mean age of 26±10 years in their study. Bhalara *et al.,* [3] reported there were 236 men and 176 women in the study population. Saini *et al.,* [4] reported out of 1217 cases of fever with thrombocytopenia, 858 were males and 359 were females. Masamatti *et al.,* [8] observed the commonest age group affected was between 18 to 30 years (48.27%) followed by 31 to 40 years (18.97%).

In this study showed that malaria was the commonest cause of fever (44.0%) followed by dengue 27(27.0%), viral fever 18(18.0%), enteric fever 5(5.0%), dengue+ malaria 3(3.0%), septicemia 2(2.0%) and hematologic malignancy 1(1.0%). Saini *et al.,* [4] reported dengue was the major cause accounting for 572 (47%) of the total cases. Second major cause was malaria in 243 (20%) cases followed by unexplained causes in 200 (16.5%) cases, septicemia in 128(10.5%), enteric fever in 12(1%) and leptospirosis in 6 (0.5%). Bhalara *et al.,* [3] observed that dengue were found 23 cases followed by malaria 37, chronic liver disease 16, hypersplenism 20, septicemia 9, gestational thrombocytopenia 6, immune thrombocytopenia purpura 13 and drug induced thrombocytopenia 4 cases. Masamatti *et al.,* [8] found that the commonest infectious etiology of febrile thrombocytopenia was Dengue 48.28%, followed by Septicemia 19.83%, Typhoid fever 15.52% and DIC 5.69%.The causes of febrile thrombocytopenia in Gandhi and Akholkarstudy was

Malaria 41.6% followed by dengue 26.7%, viral fever 16.07%, enteric 4.46% and septicaemia 4.46% [9].

In this study showed that 62(62.0%) patients had platelet count >50000/mm^3, 30(30.0%) had platelet count 20000-50000/mm^3 and 8(8.0%) patients had platelet count <20000/ mm^3. Saini *et al.,* [4] reported this study 24% of the patients were in the range of 50,000 <platelet count ≤1,50,000, followed by 38%, 25% and 13% of the patients in the range of 20,000< platelet count ≤50,000; 10000< platelet count ≤ 20,000 and up to 10000 respectively. Meena *et al.,* [5] observed that the range of platelet count was 0.07-3.14 lakhs with a mean platelet count of 52,840 cells/ cumm. 14 (14%) patients had a mild thrombocytopenia; 61 (61%) had moderate thrombocytopenia, and 15 (15%) had severe thrombocytopenia. In this study seven patients had a platelet level at the lower normal level ranging from 1.0 lakhs to 1.5 lakhs and three patients had normal level more than 1.5 lakhs. Studies done by Singh *et al.,* [7] and Khan *et al.,* [10] showed the incidence of thrombocytopenia in 61.39%, 67.2%, 73% respectively which is lower than present study.

In platelet count <20000/ mm^3, 4 patients had dengue, 2 patients had malaria, 1 patient had viral fever and 1 patient had dengue+ malaria. Saini *et al.,* [4] reported mixed infections with both dengue and malaria had highest bleeding tendency (57.14%). Among other causes, 55.3% cases of dengue, 35% cases of unexplained causes, 23.8% cases of septicemia, 27.12% cases of malaria had bleeding tendencies.

In present study showed total 65 patients showed bleeding manifestations. Petechiae were seen in 12 patients as a major bleeding manifestation followed by 8 patients having gum bleeding, 5 patients had melena, 4 patients had hematuria and menorrhagia. Saini *et al.,* [4] out of 512 patients, 468 (91.40%) patients had

petechiae/purpura. Petechiae/purpura are more commonly seen in patients with platelet count less than 20,000 and usually seen up to platelet counts of 50,000. In study of Gandhi and Akholkar observed 69 patients showed bleeding manifestations [9]. Petechiae were seen in 33 patients as a major bleeding manifestation followed by 7 patients having gum bleeding 3 patients had melena and then 2 patients each had hematuria and menorrhagia.

CONCLUSION

Fever with thrombocytopenia reveals among infections dengue and malaria are common causes because of seasonal and regional variations. All instances of febrile thrombocytopenia should be investigated and submitted to extensive platelet investigations, as this is a critical basic study for establishing the accurate diagnosis and preventing severe outcomes from the disease.

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