Original Article

Clinical and Laboratory Profile of Fever with Thrombocytopenia: A Hospital-Based Observational Study

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Abstract

Background: Fever with thrombocytopenia is a frequent clinical presentation in tropical hospitals and requires early etiological diagnosis because it can progress to bleeding, organ dysfunction, and shock. The objective of this study evaluated the clinical profile, laboratory pattern, etiological spectrum, complications, and recovery profile of patients presenting with fever and thrombocytopenia. **Material and Methods:** This hospital-based observational study included 100 patients aged more than 14 years who were admitted with fever and platelet count below 150,000/cumm at Government General Hospital, Srikakulam, from January 2026 to March 2026. Patients without fever, without thrombocytopenia, younger than 14 years, or non-cooperative were excluded. All patients underwent clinical assessment and relevant hematological, biochemical, serological, parasitological, and culture-based investigations. **Results:** Most patients were aged 21-30 years, and males constituted 60.0% of the cohort. Headache, myalgia, and vomiting were the common symptoms after fever. Fever duration was 1-5 days in 71.0% of patients. Petechiae and pallor were the leading signs. Bleeding manifestations were present in 39.0% of patients. Platelet count was most often 20,001-40,000/cumm, while 20.0% had counts below 20,000/cumm. Dengue was the leading etiology, followed by malaria, undiagnosed febrile illness, enteric fever, and septicemia. Liver function abnormalities were frequent in dengue, malaria, septicemia, and leptospirosis. Clinical recovery was documented in most patients following cause-directed treatment and supportive care. **Conclusion:** Dengue was the dominant cause of fever with thrombocytopenia in this cohort. Clinical assessment, serial platelet monitoring, and early cause-directed investigations remain central to safe management.

Keywords: Fever; Thrombocytopenia; Dengue; Malaria; Platelet count; Bleeding manifestations; Tropical infection.

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INTRODUCTION

Fever is a very common cause for internal medicine ward attendances and is frequently associated with inflammation secondary to infection, tissue damage, immune stimulation or malignancy. In the biological sense, fever is due to an increase in the hypothalamic temperature set point operating via pyrogens (cytokines) and prostaglandin E2. Fever is more useful in routine clinical practice if it is used in conjunction with other hematological abnormalities. Of these, thrombocytopenia is significant and is narrowing the differential diagnosis and is a red flag sign in admissions for possible bleeding, vascular leak, sepsis, or serious systemic inflammation.[1]

Thrombocytopenia generally is regarded as a count of less than 150,000/cumm and should be confirmed, clinically correlated and measured in severity.[2] In the tropics and subtropics, infections including dengue, malarial, leptospirosis, enteric fever, viral febrile illnesses and septicemia are most common causes of fever with thrombocytopenia. Often major cause is due to thrombocytopenia caused by marrow suppression, immune mediated platelet destruction, peripheral consumption and endothelial dysfunction caused by dengue. Studies conducted in the clinical setting have repeatedly highlighted the value of platelet count, hematocrit, liver enzymes and warning signs as predictors of severity of the disease for dengue.[3-6] Thrombocytopenia is also observed in malaria—both in Plasmodium falciparum and Plasmodium vivax infection—and reduction in platelet count can be an important finding in patients with fever from endemic regions.[7-10]

A low platelet count is not the only reason for clinical concern in a patient with a fever. Vascular integrity, platelet function, activation of coagulation, liver dysfunction, sepsis, shock, and the underlying disease process will all affect bleeding risk. In this regard, thrombocytopenia is significant in septicemia and leptospirosis, as it is an indicator of a poor outcome and high

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levels of organ involvement.[11-13] So, even if the patient has moderate thrombocytopenia and systemic toxicity should be treated as much as a patient with very low platelet count.

The structured evaluation of febrile thrombocytopenia is of practical value in resource-limited emergency settings, as a workflow for prioritizing smear examination, dengue serology, cultures, liver function tests, and supportive monitoring. Transfusion decisions for clinically indicated transfusion, along with observation intensity, is guided by serial platelet assessment. The aim of the present study was to describe the clinic-laboratory profile of fever with thrombocytopenia in patients admitted in a tertiary care hospital. The primary aims were to determine the presenting symptoms and signs, and to delineate the etiological spectrum, platelet count patterns and bleeding manifestations, liver function abnormalities, and clinical recovery profile of patients presenting with fever and thrombocytopenia.

Materials and Methods

Design and setting: This was an observational study at the Government General Hospital, General Medicine Department, Srikakulam, AP, India in a hospital setting. The research period was from January 2026 to March 2026. The study aimed to assess admitted patients with fever and who have been identified to have thrombocytopenia during the initial clinical and laboratory evaluation.

Study population and sampling involved – A total of 100 patients were included in the study by excluding non-response rate. Simple Random Sampling technique was used among the eligible patients admitted in the study period. Patients over 14 years of age were included in both genders. Patients were classified as having thrombocytopenia when platelet counts were < 150,000/cumm, in accordance with the general clinical guidelines.[2]

Inclusion and exclusion criteria: Patients were included when they had fever with documented thrombocytopenia. Patients less than 14 years of age, patients with fever and normal platelet count, patients with thrombocytopenia and no fever and non-cooperative patients were excluded. The following criteria were used to ensure a clinically homogenous study group in acute febrile thrombocytopenia.

Clinical evaluation: A detailed history was taken after admission, including history of bleeding manifestations, history of other illness and tape record of possible exposure prior to admission. In all patients, systemic examination as well as general physical examination was carried out. Special emphasis was placed on petechiae, purpura, pallor, icterus, conjunctival haemorrhage, oedema, hepatomegaly, splenomegaly, altered sensorium, gastrointestinal bleeding and gum bleeding.

Laboratory investigations: All the patients had complete blood picture, peripheral smear and platelet counts, and erythrocyte sedimentation rate were performed in the laboratory. A malarial examination and a bacterial examination using the peripheral smear were performed for malarial parasites and changes indicative of bacterial infection respectively. Rapid tests (RT) for Plasmodium vivax and Plasmodium falciparum were conducted if necessary. Widal test was ordered for any suspected enteric fever. Dengue IgM ELISA was done after 5th day of fever onset or when there was an increase in titres clinically. A total of 15 cases were clinically suspected which were subjected to Leptospira IgM ELISA and blood cultures. Liver function tests such as total bilirubin, serum glutamic oxaloacetic transaminase and serum glutamic pyruvic transaminase were obtained. Treatment and support for disease were given as per final clinical diagnosis and hospital treatment. As part clinical monitoring, platelet count was repeated during admission particularly in the patients who had bleeding, shock, altered sensorium, severe thrombocytopenia, and deteriorating systemic illness.

The outcomes were recorded in the form of platelet count, bleeding manifestations, etiological diagnosis, liver function abnormalities, and recovery status, and were analysed statistically. All the data were tabulated on a proforma designed to facilitate internal consistency checks and analysis. Continuous laboratory values were grouped for clinical interpretation if necessary. Frequencies and Percentages were used to summarize the data. Data are reported in tabular format to present the distributions of demographic variables, clinical features, platelet count levels, etiologies, complications, and in-hospital time to recovery.

Ethical considerations: This study was carried out after getting the approval from the institutional Ethics Committee, Government Medical College-Government General Hospital, Srikakulam, Andhra Pradesh, India (IEC2025F/GMC&GGH/SKLM/151225/03). The study was observational only and no other intervention was done other than the routine clinical examination and the normal hospital-based management. Patient identity was anonymized in this study. No personal identifiers were used during data analysis or reporting; all clinical and laboratory data were recorded in an anonymous format. The study was conducted in an ethical manner and in accordance with the principles of biomedical research on human persons accepted by institutions.

Results

A total of 100 patients with fever and thrombocytopenia were included. The largest age group was 21-30 years, followed by 14-20 years and 31-40 years, indicating that most patients were young adults or adolescents. Males constituted 60.0% of the cohort, with a male-to-female ratio of 1.5:1. Most patients presented within the first 5 days of fever, and 91.0% presented within 10 days of symptom onset [Table 1].

Table 1: Demographic profile and duration of fever among study subjects

Variable	No. of patients	%
Age group (years)		
14-20	25	25.0
21-30	28	28.0
31-40	23	23.0
41-50	15	15.0

51-60	8	8.0
61-70	1	1.0
Total	100	100.0
Sex		
Male	60	60.0
Female	40	40.0
Total	100	100.0
Duration of fever		
1-5 days	71	71.0
6-10 days	20	20.0
11-15 days	5	5.0
15-20 days	4	4.0
Total	100	100.0

Headache and myalgia were the most frequent associated symptoms, followed by vomiting and abdominal pain. On clinical examination, petechiae were the leading sign, followed by pallor, splenomegaly, and icterus. Bleeding manifestations were present in 39.0% of patients; petechiae were the most common bleeding manifestation, followed by gastrointestinal bleeding, purpura, and bleeding gums [Table 2].

Table 2: Associated symptoms, clinical signs, and bleeding manifestations

Clinical variable	No. of patients	%
Associated symptoms		
Headache	30	30.0
Myalgia	29	29.0
Vomiting	17	17.0
Pain abdomen	7	7.0
Generalized weakness	5	5.0
Altered sensorium	5	5.0
Loose stools	4	4.0
Rash	3	3.0
Clinical signs on examination		
Petechiae	45	45.0
Pallor	34	34.0
Splenomegaly	17	17.0
Icterus	16	16.0
Hepatomegaly	4	4.0
Pedal edema	3	3.0
Conjunctival hemorrhage	2	2.0
Bleeding manifestations		
Present	39	39.0
Absent	61	61.0
Petechiae as bleeding manifestation	14	14.0
Gastrointestinal bleed	8	8.0
Purpura	8	8.0
Bleeding gums	7	7.0
Subconjunctival hemorrhage	2	2.0

Admission platelet count ranged from less than 10,000/cumm to 150,000/cumm. The largest platelet-count category was 20,001-40,000/cumm, followed by 40,001-60,000/cumm and 60,001-80,000/cumm. Dengue was the predominant etiology, accounting for more than half of the cases. Malaria contributed 19.0% when Plasmodium falciparum, Plasmodium vivax, and mixed infection were considered together [Table 3].

Table 3: Admission platelet count and etiological distribution

Variable	No. of patients	%
Platelet count at admission (/cumm)		
0-10,000	12	12.0
10,001-20,000	8	8.0
20,001-40,000	27	27.0
40,001-60,000	18	18.0
60,001-80,000	17	17.0
80,001-100,000	11	11.0
100,001-150,000	7	7.0
Total	100	100.0
Etiological diagnosis		
Dengue	52	52.0
Plasmodium falciparum malaria	13	13.0
Unknown etiology	13	13.0

Enteric fever	8	8.0
Plasmodium vivax malaria	5	5.0
Septicemia	4	4.0
Immune thrombocytopenic purpura	2	2.0
Mixed P. vivax + P. falciparum malaria	1	1.0
Hematological disease	1	1.0
Leptospirosis	1	1.0
Total	100	100.0

Platelet-count distribution differed by etiology. Dengue showed a wide distribution across platelet categories, with 22 patients having counts below 40,000/cumm. Low platelet counts were also observed among malarial infections, especially Plasmodium falciparum malaria. Both patients with immune thrombocytopenic purpura had platelet counts at or below 20,000/cumm [Table 4 & Figure 1].

Table 4: Platelet count distribution according to etiology

Etiology	<=20,000	20,001-40,000	40,001-60,000	60,001-80,000	80,001-100,000	100,001-150,000	Total
Dengue	7	15	9	12	6	3	52
Enteric fever	3	1	2	0	1	1	8
Hematological disease	1	0	0	0	0	0	1
Immune thrombocytopenic purpura	2	0	0	0	0	0	2
Leptospirosis	0	1	0	0	0	0	1
P. falciparum malaria	3	4	4	1	0	1	13
Mixed malaria	1	0	0	0	0	0	1
P. vivax malaria	1	2	1	0	1	0	5
Septicemia	0	1	0	1	2	0	4
Unknown	2	3	2	3	1	2	13
Total	20	27	18	17	11	7	100

Values are expressed as number of patients. Platelet counts are expressed per cubic millimeter (/cumm).

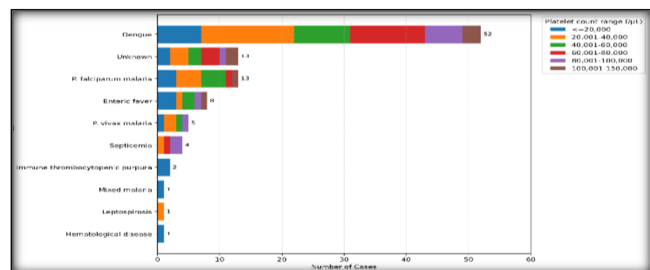

Figure 1: Platelet Count Distribution According to Etiology

Bleeding manifestations were not restricted to the lowest platelet category; petechiae and purpura were frequently observed in the 21,000-40,000/cumm range, whereas upper gastrointestinal bleeding occurred only when platelet count was below 20,000/cumm. Liver function abnormalities were noted in several etiological groups [Table 5]. Documented recovery was observed in 95 patients, reflecting a favourable response to cause-directed care and supportive monitoring.

Table 5: Bleeding pattern and liver function profile

Panel A. Bleeding manifestations in relation to platelet count

Bleeding manifestation	<20,000	21,000-40,000	41,000-60,000	61,000-80,000	81,000-100,000	100,000-150,000
Petechiae	5	10	2	2	1	0
Purpura	4	5	1	2	0	0
Subconjunctival hemorrhage	2	2	1	0	0	0
Bleeding gums	1	1	1	0	0	0
Upper gastrointestinal bleed	2	0	0	0	0	0

Panel B. Liver function test profile across major etiologies

Etiology	n	Total bilirubin normal/abnormal	SGOT normal/abnormal	SGPT normal/abnormal
Dengue	52	47/5	19/33	27/25
Malaria	19	11/8	10/9	6/13
Enteric fever	8	8/0	3/5	5/3
Leptospirosis	1	0/1	0/1	1/0
Septicemia	4	1/3	0/4	3/1
Immune thrombocytopenic purpura	2	1/1	1/1	1/1

SGOT, serum glutamic oxaloacetic transaminase; SGPT, serum glutamic pyruvic transaminase. Liver-function values are presented as normal/abnormal counts.

Discussion

The present study shows that fever with thrombocytopenia was predominantly an infectious syndrome in this tertiary-care cohort. Young adults formed the major age group, and males were more frequently affected. This pattern is clinically plausible

in tropical settings where outdoor exposure, vector contact, occupational mobility, and delayed care-seeking contribute to a higher burden of acute febrile illnesses in young adults. Common associated symptoms were headache, myalgia and vomiting which are consistent with both the most important etiological groups in this study: dengue and malaria.

The predominant diagnosis was dengue, accounting for over 50% of cases. Thrombocytopenia, constitutional symptoms, elevation of liver enzymes and bleeding manifestations have been shown to occur in previous clinical and laboratory studies conducted for dengue.[3-6] These results are consistent with this trend, notably the prevalence of petechia and transaminase alteration in dengue patients. Platelet count decrease is due to various mechanisms in dengue, such as marrow suppression, immune mediated destruction, endothelial activation and peripheral consumption. Thus, platelet counts alone should be used with caution and along with clinical red flag indicators and liver function tests.

The second leading etiological group was malaria with 19.0% of cases. Thrombocytopenia has been reported in published studies as one of the most common blood anomalies associated with malaria and may aid in diagnosis in febrile subjects from malaria-endemic areas.[7-10] In this cohort, the types of malaria were found to be Plasmodium falciparum and Plasmodium vivax, with moderate-to-severe platelet reduction in a few cases of malaria. Malaria-associated thrombocytopenia is generally self-limited, but the severe consequences of falciparum malaria may be related to organ dysfunction and shock.[10]

In 39.0 percent of the patients, there were bleeding manifestations. Regrettably, there was no simple linear correlation of bleeding with platelet count. Petechiae and purpura were present in a high proportion of the 21,000-40,000/cumm range and gastrointestinal bleeding was seen in patients with fewer than 20,000/cumm. This observation confirms the concept of bleeding risk not only related to platelet count, but also to the severity of the infection, coagulation abnormalities, liver dysfunction, vascular injury and host factors.[2,13]

Clinically less important but more frequent were leptospirosis and septicemia. Previous investigations have found that thrombocytopenia in leptospirosis is correlated with severe disease, renal involvement, and complicated hospital course.[11,12] Likewise, in the case of sepsis and septic shock, the determination of platelet count is important clinically and is a favorable prognostic marker.[13] Septicemia was a smaller etiological subgroup and was a relatively uncommon complication of febrile thrombocytopenia, so that close attention must be paid to septicemia in the present study. The results highlight the importance of initiating early cultures, initiating antimicrobial therapy, and close monitoring. The overall recovery rate is high, which highlights the importance of timely etiological diagnosis, platelet monitoring and cause directed supportive care.

Limitations: This study was conducted at one centre and was hospital-based, thus the distribution of disease at the community level was not reflected. The number of patients included in the sample was relatively small and follow up discontinued at the time of discharge. There was no consistent availability of viral serotyping, coagulation profile, bone marrow evaluation, inflammatory markers and advanced severity scores. The etiology was not determined in 13 patients, which limited the precision of assigning a specific etiology for thrombocytopenia in this subgroup, and restricted interpretation in final analysis.

Conclusion

The predominant clinical syndrome in this hospital group was fever associated with thrombocytopenia with dengue as the commonest diagnosis followed by malaria and enteric fever. The largest subset consisted of young adults and males. The most common clinical-laboratory markers were headache, myalgia, petechiae, pallor, and elevated liver enzymes. Thrombocytopenia was severe in many instances but bleeding was not limited to the lowest platelet categories, further emphasizing the importance of careful clinical observation in addition to serial platelet monitoring. The majority of patients had improvement with focussed treatment. Overall, the use of early etiological testing and supportive care with careful surveillance can enhance patient outcome in a safe and reliable manner in a routine clinical setting in a tertiary hospital.

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Conflicts of interest

There are no conflicts of interest.

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