

Original research article

A Study of Clinical and Lab Profile of Cases of Fever with Thrombocytopenia

Dr. Gadiga Srikanth Goud¹, Dr. Vasanth Kumar Suram², Dr. Jilla Naganna³, Dr. Ravindar Kumar Gadi⁴

¹Assistant Professor, Dept. of General Medicine, Gandhi Medical College and Hospital, Secunderabad, Telangana State.

²Assistant Professor, Dept. of General Medicine, Gandhi Medical College and Hospital, Secunderabad, Telangana State.

³Assistant Professor, Dept. of General Medicine, Gandhi Medical College and Hospital, Secunderabad, Telangana State.

⁴Assistant Professor, Dept. of General Medicine, Gandhi Medical College and Hospital, Secunderabad, Telangana State.

Corresponding Author: Dr. Ravindar Kumar Gadi.

E-mail: dr.ravindarkumargadi@gmail.com

Abstract

Background: Fever is a common problem in medicine since it is the occult presentation of common diseases rather than actual disorders. Although infection is the most prevalent cause of thrombocytopenia, thrombocytopenia accompanied by fever aids in the differential diagnosis and management of fever. The present study aimed to evaluate the clinical and laboratory profile of cases of fever with thrombocytopenia.

Methods: Based on the inclusion and exclusion criteria a total of n=160 cases were included in the study. A detailed history was obtained regarding the duration of fever, and history of travel. Symptoms of headache, nausea, vomiting, abdominal pain, diarrhea, cough, anorexia, myalgia, gum bleeding, oliguria, hematuria, and weight loss were noted. Rashes, dehydration signs, petechiae, jaundice, lymphadenopathy, hepatomegaly, splenomegaly, anemia, abdominal pain, altered sensorium, and other symptoms were noted.

Results: The common cause of fever with thrombocytopenia in this study was Dengue in 53.12% of cases followed by malaria in 13.75% cases and septicemia and enteric fever was the cause in 6.25% of cases. Cases of both dengue and malaria were detected in 5% of cases and leptospirosis was in 3.12% cases and unspecified cases were 12.5%. The mean platelet count in the study was 55600/mm³. N=37(23.12%) of cases in the study were having platelet counts below 40000/mm³.

Conclusion: The most prevalent cause of fever in people with thrombocytopenia is infection. Dengue was the most prevalent cause of febrile thrombocytopenia, followed by malaria, particularly in epidemic situations. Early identification of the causative infection of febrile thrombocytopenia followed by appropriate treatment will lead to complete recovery and a good outcome.

Keywords: Thrombocytopenia, Fever, Dengue, Malaria

Introduction

Fever is defined as an increase in body temperature over the usual circadian range caused by a shift in the anterior hypothalamic thermoregulatory center, which is situated in the hypothalamus and occurs in combination with an increase in hypothalamic set point 37°C to 39°C. [1-4] Fever is such a prevalent feature of the disease that reliable descriptions of feverish individuals in early-recorded history are not unexpected. [5] Hippocrates and subsequent physicians throughout the Roman empire provided thorough accounts of fever and its many patterns of presentation. [6] Thrombocytopenia is defined as a low platelet count <150,000/ μ l in the circulatory blood. A typical platelet count varies from 1,50,000 to 4,50,000 platelets/ μ L of blood. Patients with thrombocytopenia may frequently remain asymptomatic and are detected by a standard full blood count. The possible causes of thrombocytopenia could be decreased production of platelets, increased destruction, and increased sequestration in the spleen. The commonest cause of thrombocytopenia is infections. [2, 3] Patients with very low platelet counts may experience bleeding manifestations such as petechiae, epistaxis, gum bleeding, hematuria, gastrointestinal hemorrhage, or intracranial hemorrhage. Thrombocytopenia is the most common cause of bleeding in children. [7-9] In several febrile illnesses, serial platelet counts have predictive significance because thrombocytopenia has an inverse relationship with mortality and morbidity. This emphasizes the significance of thrombocytopenia in a variety of febrile illnesses. [10] Thrombocytopenia can be the first sign of a severe illness such as leukemia. This stresses the need for a thorough investigation. Therefore, a well-organized systemic approach that is carried out with an awareness of the cause of fever with thrombocytopenia can shorten the duration of the investigation and bring out the diagnosis. Hence, with the need for the study to know the causes and complications of fever with thrombocytopenia we conducted this study in our Tertiary care Teaching Hospital.

Material and Methods

This cross-sectional interventional study was carried out in the Department of General Medicine, Gandhi Medical College, and Hospital, Secunderabad, Hyderabad. Institutional Ethical approval was obtained for the current study after duly following the process of the ethics committee for human research. Written consent was obtained from all the participants of the study

Inclusion criteria

1. Patients aged above 13 years
2. Males and females
3. Fever with a temperature > 99.9° F
4. Platelet counts of less than 1.5 lakhs/mm³

Exclusion criteria

1. Pediatric cases.
2. Cases of thrombocytopenia without fever
3. History of platelet disorders or dysfunctions
4. Patients on antiplatelet therapy
5. Patients on chemotherapy

Based on the inclusion and exclusion criteria a total of n=160 cases were included in the study. A detailed history was obtained regarding the duration of fever, and history of travel. Symptoms of headache, nausea, vomiting, abdominal pain, diarrhea, cough, anorexia, myalgia, gum bleeding, oliguria, hematuria, and weight loss were noted. Rashes, dehydration signs,

petechiae, jaundice, lymphadenopathy, hepatomegaly, splenomegaly, anemia, abdominal pain, altered sensorium, and other symptoms were noted. On admission, blood urea, serum creatinine, serum electrolytes, peripheral smear, X-ray chest, and USG abdomen were all performed. Other tests include a peripheral smear for MP, dengue serology, widal study, IgM antibody for leptospirosis, sputum AFB, HIV1 and 2 ELISA, blood and urine cultures, and bone marrow aspiration. CBCs were repeated every two days during the hospital stay for all patients. Unless the patient developed ARF, in which case the tests were done daily, the renal function tests were repeated every third day.

Statistical analysis:

The data was collected and uploaded on an MS Excel spreadsheet and analyzed by SPSS version 22 (Chicago, IL, USA). Quantitative variables were expressed on mean and standard deviations and qualitative variables were expressed in proportions and percentages. Fisher's exact test has been used to find the difference between two proportions.

Results

In the present study out of n=160 cases, n=108(67.5%) were males and n=52(32.5%) were females. The range of age in the present study was 14.0 to 55.0 years the mean age group of males in the study was 28.5 ± 10.5 years and females were 26.5 ± 8.5 years. The most common age group involved in the study was 21 – 30 years with a total of n=58(36.25%) of patients. The next common age group involved was 31 – 40 years with n=46(28.75%) of the patients the details has been depicted in table 1.

Table 1: Demographic profile of cases included in the study

Age Group	Males	Females	No. of Cases	Percentage
13 – 20	21	09	30	18.75
21 – 30	38	20	58	36.25
31 – 40	30	16	46	28.75
41 – 50	19	07	26	16.25
> 50	108	52	160	100.00

Out of the total n=160 cases based on the seasonal appearance of the cases n=120(75%) cases were from the months of July to November which is the peak season for the recording of cases of thrombocytopenia. The month-wise record of the cases obtained in our study has been depicted in figure 1.

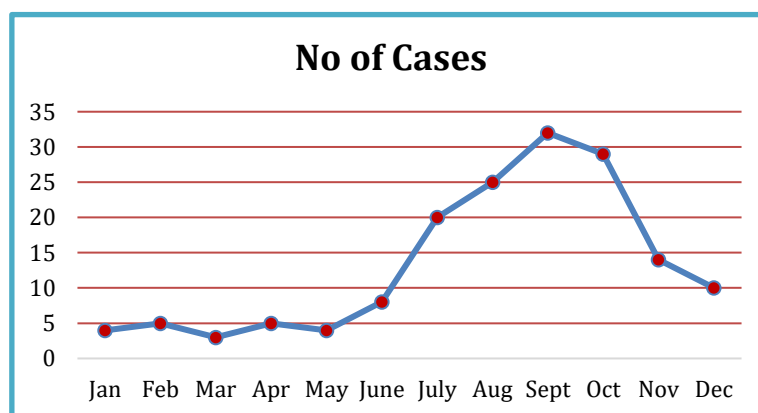


Figure 1: Seasonal variation of the cases recorded in the study

The most common presenting symptom is fever in 100% of cases followed by myalgia in 56.25% of cases and chills and rigor was found in 53.12% of cases. The other common symptoms were abdominal pain vomiting in 26.25% of cases breathlessness in 23.75% of cases. The other symptoms and their frequency and percentage have been given in table 2. In the study, the common symptom was dehydration in 40.62% of cases followed by pallor in 15% of cases, jaundice in 11.25% of cases, and Hypotension in 9.37% of cases. Hepatomegaly in 8.12 and splenomegaly in 6.87. Pleural effusion in 6.25% of cases is depicted in figure 2. The mean duration of hospitalization in the cases of the study was 8.25 ± 2.5 days and the range was 4 days to 21 days.

Table 2: Common symptoms reported by patients in the study

<i>Symptom</i>	<i>Frequency</i>	<i>Percentage</i>
Fever	160	100
Chills and rigor	85	53.12
Myalgia	90	56.25
Arthralgia	15	8.75
Abdominal pain vomiting	42	26.25
Cough	13	8.12
Breathlessness	38	23.75
Rashes	20	12.5
GI bleeding	5	3.12
Conjunctival effusion	11	6.87
Loss of weight	10	6.25
Altered sensorium	16	10

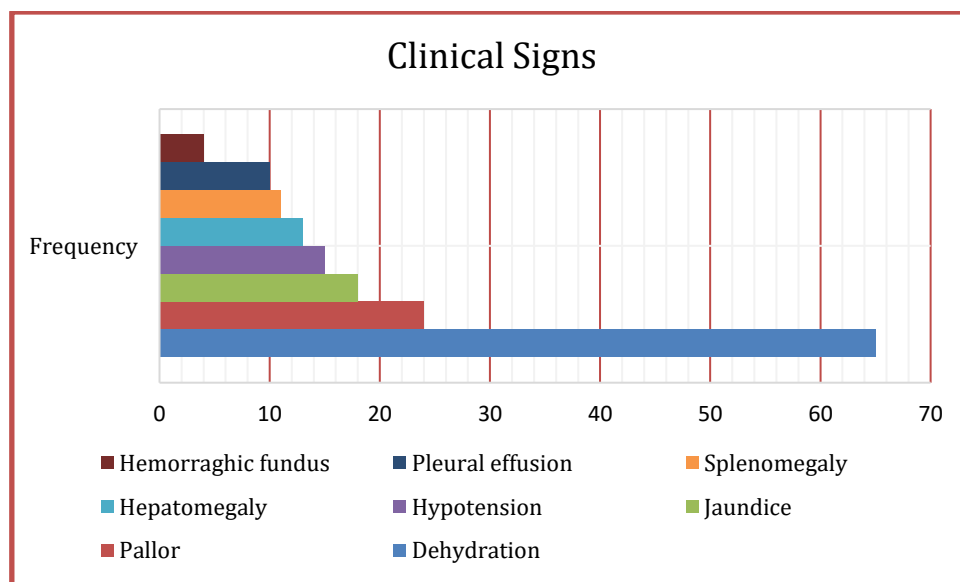


Figure 2: Showing the common clinical signs recorded in the cases of the study

The etiological factor was established in all the cases of the study. The common cause of fever with thrombocytopenia in this study was Dengue in 53.12% of cases followed by malaria in 13.75% cases and septicemia and enteric fever was the cause in 6.25% of cases. Cases of both dengue and malaria were detected in 5% of cases and leptospirosis was in 3.12% cases and unspecified cases were 12.5% depicted in table 3.

Table 3: Etiology of fever with thrombocytopenia

<i>Diagnosis</i>	<i>Frequency</i>	<i>Percentage</i>
Dengue	85	53.12
Malaria	22	13.75
Septicemia	10	6.25
Dengue + Malaria	8	5.00
Enteric fever	10	6.25
Leptospirosis	5	3.12
Unspecified	20	12.5

A total of n=37(23.12%) cases were having bleeding tendencies. In n=85 cases of dengue n=21(25.93%) cases were having bleeding tendencies the p values were (<0.001) considered significant. Similarly, Dengue and malaria combine produced bleeding tendencies in 50% of their cases while septicemia produced bleeding tendencies in 30% of the cases all the p-values were <0.05 hence considered significant details are depicted in table 4.

Table 4: Etiology of thrombocytopenia and bleeding tendencies

<i>Diagnosis</i>	<i>Frequency</i>	<i>Bleeding tendencies</i>	<i>Percentage</i>	<i>X²</i>	<i>p-value</i>
Dengue	85	21	25.93	55.23	0.001*
Malaria	22	6	27.27	67.54	0.041*
Septicemia	10	3	30.00	99.89	0.030*
Dengue + Malaria	8	4	50.00	181.2	0.001*
Enteric fever	10	0	0.00	0.00	0.125
Leptospirosis	5	0	0.00	0.00	0.334
Unspecified	20	3	15.00	10.22	0.021*

* Significant

The mean hemoglobin concentration in the patients was found to be 11.25 ± 3.5 gm/dl and the range was 6.5 to 15.0 gm/dl. The mean hematocrit value in the patients was 36.5% and the range was 28 to 55%. All the 100% cases in this study were with thrombocytopenia the platelet counts were less than 1.5 lakh/mm^3 . The mean platelet count in the study was $55600/\text{mm}^3$. The range of the platelet counts was 9500 to $125000/\text{mm}^3$. The mean platelet counts in the patients with bleeding tendencies were $28000/\text{mm}^3$. N=37(23.12%) of cases in the study were having platelet counts below $40000/\text{mm}^3$ given in table 5. Platelet transfusions were given in n=15 cases with platelet counts below $20000/\text{mm}^3$ other cases with mean platelet counts higher improved without any transfusion.

Table 5: the distribution of platelet count recorded in the study

<i>Platelet count</i>	<i>Frequency</i>	<i>Percentage</i>
< 1,50,000	160	100.0
40,000 – 50,000	80	50.00
20,000 – 40,000	30	18.75
< 20,000	7	4.37

The renal function test evaluation of the cases found n=10(6.25%) cases were with elevated renal function parameters and n=8 cases improved with rehydration therapy alone and n=2 required nephrologist's intervention and dialysis. Out of the total n=160 cases subjected to liver

function tests n=18(11.25%) cases were found to have elevated liver function tests. Out of these cases, n=4 cases were with bilirubin levels of >5.0 mg/dl of these n=4 cases n=2 cases (1.25%) had died. Rest all the cases recovered and the mean platelet counts were > 1.4 lakhs at the time of discharge.

Discussion

The important observations of the current study are fever with thrombocytopenia is more common in males as compared to females. The mean age of the cases in the study was 27.5 years. The frequency of cases is greatest in the month from July to November. Fever with chills and rigor and myalgia are common presentations. The most prevalent cause is dengue in 53.12% of cases. Clinical manifestation of thrombocytopenia was evident in n=37(23.12%) cases. Platelet transfusions were given in n=15 cases with platelet counts below 20000/mm³ other cases with mean platelet counts higher improved without any transfusion. In our study n=2(1.25%) cases expired due to deranged liver functions. In our study, we found that 53.12% of cases with dengue and 13.75% of cases diagnosed with malaria had fever and thrombocytopenia. Similar observations were made by Patil et al.,^[11] Lakum et al.,^[12] and Gandhi et al.,^[13] also found dengue as the second most common infectious cause of fever with thrombocytopenia. Similar to our study male preponderance in the cases have been reported by other studies.^[14] Nair et al.,^[9] in a similar study in New Delhi found 14% of the case with dengue and 27% of cases of fever with thrombocytopenia to be associated with septicemia. Prithviraj et al.,^[15] studying fever and thrombocytopenia in Kohlapur, Maharashtra found 15% of cases diagnosed with dengue and 54% of patients were diagnosed with malaria. These variations in observations may be due to seasonal and geographical variations including the difference in the year of the study. The fact that the present study was conducted in the zone known to be prone to dengue fever could be the reason for higher dengue patients in our study. In a study conducted by UM Jadav et al.,^[16] Thrombocytopenia in malaria - correlation with type and severity of malaria. Normal platelet count was noted in 21.6% of cases. But in our study, n=41, no patients had a normal platelet count. Thrombocytopenia was seen in 40-90% of patients infected with plasmodium falciparum in India.^[16] Thrombocytopenia is a common finding in malaria and about 80% of malaria patients have the same.^[17] UM Jadav et al.,^[16] recorded that a normal platelet count was noted in 21.6% of cases. But in our study, n=22 cases, no patients had normal platelet count. In our study, clinical manifestations of thrombocytopenia were found in n=37(23.12%) cases including petechiae and purpura. A.M Naikwadi et al.,^[18] in their study found 18% of cases with severe thrombocytopenia, 35% of patients with moderate thrombocytopenia, and 47% of patients with mild thrombocytopenia. KS Saini et al.,^[19] in a similar study in Rajasthan found a clinical manifestation of thrombocytopenia in 42.7% of patients which is comparatively higher than our finding. They found petechiae/purpura in 91.4% of cases as the commonest bleeding manifestation followed by spontaneous bleeding in 57% of cases. Bleeding manifestations were shown in 23.12% of cases in the study. Patil et al.,^[11] and Dash et al.,^[20] found bleeding manifestation in the form of petechiae in 73.9% and 66% of the cases in their study respectively. In our study, 98.75% of patients recovered completely those with very low platelet counts were transfused with platelet. Similar observations of good recovery have been made by Patil et al., in 95% of cases in their study. Limitations of the present study were because this is a single-center study, and many cases are referred to this tertiary care from the other peripheral centers may not reflect the true picture of the disease. The second constraint was only a limited number of patients were included in the study because of various reasons that included voluntary participation in the cases and availability of all laboratory reports.

Conclusion

Treatment of patients with fever and thrombocytopenia because of occult presentations of common diseases rather than uncommon diseases. The most prevalent cause of fever in people with thrombocytopenia is infection. Dengue was the most prevalent cause of febrile thrombocytopenia, followed by malaria, particularly in epidemic situations. Early identification of the causative infection of febrile thrombocytopenia followed by appropriate treatment will lead to complete recovery and a good outcome.

References

1. Lakshmi Prasanna Gutthi, Sunita Vegesna, Varanasi Pundarikaksha, Swetha Kolla, Manasa Gundapaneni, Prudhvi Krishna Karimi. A Study of Clinical and Lab Profile of Fever with Thrombocytopenia. International Journal of Contemporary Medical Research 2017; 4:77-83.
2. Ambruso DR, Hays T, and Goldenberg N. Hematologic disorders in current Pediatric diagnosis and treatment 18th edition a Lange medical books. Mc Graw-Hill. 2007:860-62.
3. Handian RI. Bleeding and thrombosis. Chapter 62, In Harrison principles of internal medicine, 15th Ed. Vol.1, Edt. Braunwald et al, USA: McGraw Hill, 2001; p. 358.
4. Mackowiak PA, Boulant JA. Fever's upper Limit: In Fever: basic mechanisms and management. Ed. Mackowiack PA), New York, Lippincott-Raven Publishers, Philadelphia, 1997; p. 147- 63.
5. Swash, M. Doctor and patient: In Hutchinson's Clinical Methods. 20th edition, 1995; p. 22.
6. Dinarello CA. Infection, fever, and exogenous and endogenous pyrogens: some concepts have changed. J Endotoxin Res. 2004;10(4):201-22.
7. Shirley Parker Levine. Miscellaneous causes of thrombocytopenia. Chapter- 64, In Wintrobe's clinical hematology, 10th Ed. Vol. 2, Baltimore: Williams and Wilkins, 1999 p. 1627-29.
8. George JN, Rizvi MA. Thrombocytopenia. In: William's hematology, 6th Ed, USA: McGraw Hill, 2001 p. 1501
9. Nair PS, Jain A, Khanduri U, Kumar V. A study of fever associated with Thrombocytopenia. JAPI 2003; 51: 115-73.
10. Frank Firkin. *De Gruchy's Clinical Hematology in Medical Practice*. 5th Ed: Wiley 1990; 375.
11. Patil P, Solanke P, Harshe G. To Study Clinical Evaluation and Outcome of Patients with Febrile Thrombocytopenia. IJSAR. 2014; 4:1-3.
12. Lakum N, Makwana H, Shah R. A study of laboratory profile of fever with thrombocytopenia in adult patient at C.U. Shah Medical College, Surendranagar, SEAJCRR. 2014; 3:556-561.
13. Gandhi AA, Akholkar PJ. Clinical and laboratory evaluation of patients with febrile thrombocytopenia. NJMR. 2015; 5:43-46
14. Raikar SR, Kamdar PK, Dabhi AS. Clinical and Laboratory Evaluation of Patients with Fever with Thrombocytopenia. IJCP. 2014; 24:360-363.
15. Prithviraj Patil, Pranita Solanke, Gayatri Harshe. To study clinical evaluation and outcome of patients with febrile thrombocytopenia. International Journal of Scientific and Research Publications 2014; 4:1-3.
16. Jadhav UM, Patkar VS, Kadam NW. Thrombocytopenia in malaria – correlation with type and severity of malaria. J Assoc Physician India, 2004; 52: 615-18.
17. Kakar A, Bhoi S, Prakash V, Kakar S. Profound Thrombocytopenia in Plasmodium vivax malaria. Diagn Microbiol Infect Dis 1999; 35: 243-44.
18. Aman M Naikwadi, Sayyad Nikhat Anjum. Study of clinical and laboratory profile of fever

with thrombocytopenia in a tertiary hospital. International Journal of Contemporary Medical Research 2019;6(7): G35-G38.

19. KS Saini, RP Agarwal, S Kumar, P Tantia, K Thakkar, AK Sharma. Clinical and etiological profile of fever with thrombocytopenia A tertiary care hospital-based study. Journal of Association of Physicians of India 2018; 66(4):1-5.
20. Dash HS, Ravikiran P, Swarnalatha G. Study of clinical and laboratory profile of fever with Thrombocytopenia and its outcome During hospital stay. IJSR. 2013; 2:445-447.