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Article

Spectrum of thrombocytopenia in febrile ill children along with its clinical manifestations in a tertiary health care centre-A descriptive study

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Abstract: Introduction: Fever with thrombocytopenia is a common clinical presentation among patients in tertiary care hospitals. Various etiologies, such as malaria, dengue, leptospirosis, typhoid, miliary tuberculosis, and septicemia, are the common causes of fever with thrombocytopenia. Aim: This study aimed to determine the various etiologies of febrile illness in children with thrombocytopenia, study their bleeding and clinical manifestations, and examine their correlation with the severity of platelet count.
Materials and methods: This study included 1000 pediatric patients with thrombocytopenia between January 2021 and December 2021 at an autonomous state medical college in Firozabad, Uttar Pradesh.
Results: In our study, the most common etiology was dengue, followed by sepsis and hematological malignancies. The most common age group of patients was 10-15 years. The severity of cases was determined based on the grading of thrombocytopenia and bleeding and clinical manifestations. Fever and myalgia were the most common clinical presentations of patients with thrombocytopenia.
Conclusion: Platelet count is a good predictor of bleeding manifestations due to severe thrombocytopenia, which can lead to life-threatening conditions. Prompt diagnosis is crucial to start treatment as soon as possible, including platelet transfusions for patients.

Keywords: Dengue fever; Platelet count; National cancer Institute.

1. Introduction

When the platelet count is below 1.5 lakhs/μl, this condition is defined as 'thrombocytopenia'. Thrombocytopenia occurs either due to decreased platelet production in the bone marrow or due to increased destruction. There are no definite criteria for the classification of mild, moderate, or severe thrombocytopenia that exist [1]. The National Cancer Institute has provided the Common Toxicity Criteria, which will be followed to define the severity of thrombocytopenia [1].

Infections are the most common cause of thrombocytopenia [2,3]. Bleeding manifestations, such as petechiae, epistaxis, gum bleeding, haematuria, gastrointestinal haemorrhage, or intracranial bleeding, may occur in patients with thrombocytopenia. The most common cause of bleeding in children is thrombocytopenia [4–6]. In India, infections like Malaria, Dengue, Leptospirosis, Typhoid, Miliary tuberculosis, and Septicaemia often lead to fever and subsequently thrombocytopenia [7].

Nowadays, most patients who visit tertiary hospitals present with fever and thrombocytopenia. If clinicians can make the diagnosis of fever with thrombocytopenia as early as possible, life-threatening manifestations such as intracerebral bleed, haemorrhage into vital organs, shock, and death can be prevented from occurring [8–11]. Dengue is a well-known infective cause of fever with thrombocytopenia. Thrombocytopenia is not a disease but a diagnosis. Hemorrhagic manifestations start appearing when the platelet count is below 5000/microliter, which is an emergency situation to prevent mortality and morbidity.

The Dengue epidemic has become a serious concern for public health nowadays because no antiviral drugs or vaccine has proven effective in fighting this infection. Only symptomatic treatment is provided to the patient. The disease varies from a mild, self-limiting illness to Dengue hemorrhagic fever and Dengue shock syndrome.

Dengue fever is an acute febrile illness that presents symptoms such as bone or joint and muscular pain, headache, leukopenia, and rash. In returned travellers, Dengue fever is commonly seen [12].

2. Objectives of the Study

The objectives of this prospective study were to identify the various causes of thrombocytopenia in febrile children, examine their bleeding and clinical manifestations, and determine the correlation between the severity of platelet count and these manifestations.

3. Materials and Methods

The study was conducted on 1000 children with thrombocytopenia and fever, aged below 18 years, over a period of one year (January 2021 to December 2021) at Autonomous State Medical College, Firozabad (U.P.). Informed consent was obtained from all participants. Patients with platelet disorders or dysfunction, those taking medication causing thrombocytopenia or antiplatelet drugs, and those without available clinical details were excluded from the study.

History and physical examination were conducted on all patients, and routine investigations were performed along with specific diagnostic tests where necessary. Blood samples were processed within 30 minutes to avoid false thrombocytopenia. The CBC count was determined using a fully automatic 5-cell counter, and the results were confirmed by peripheral smear examination. Haematological malignancies and aplastic anaemia were diagnosed based on peripheral smear examination and confirmed with immunohistochemistry. Diagnostic tests for Dengue, Leptospirosis, Scrub typhus, and Malaria were also performed.

All clinical findings and lab test reports were analysed.

4. Results

A total of 1000 patients of febrile illness with thrombocytopenia were studied out of which 630 (63%) were males and 370 (37%) were females . In our study ,most common aetiology seen was dengue (55%) followed by Sepsis (15%) and haematological malignancies (9.8%) as shown in Table 1 and Figure 1.

Table 1. Aetiologies of febrile thrombocytopenia

ETIOLOGY	CASES OF THROMBOCYTOPENIA	
	Number	PERCENTAGE(%)
Dengue	550	55
Sepsis	150	15
Hematological malignancies	98	9.8
Leptospirosis	80	8.0
Scrub typhus	50	5.0
Malaria	47	4.7
Idiopathic	20	2.0
Aplastic anemia	5	0.5
Total	1000	100

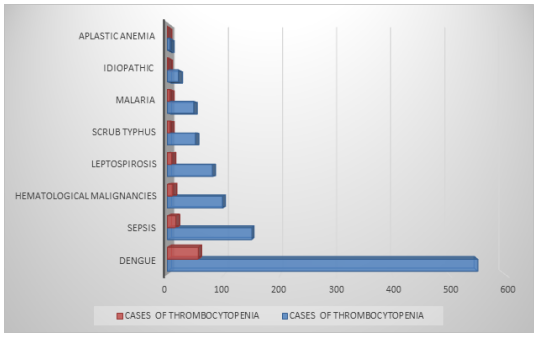

Figure 1. Aetiologies of Febrile Thrombocytopenia

The most age group in which patient belong to was 10 - 15 years followed by 5 - 10 years and least in the group of 15 - 18 years as shown in Table 2 and Figure 2.

Table 2. Age wise distribution

Age Groups	No. of Cases	Percentage %
0 -4 years	148	14.8
5-9 years	312	31.2
10-14 years	458	45.8
15-18 years	82	8.2
TOTAL	1000	100

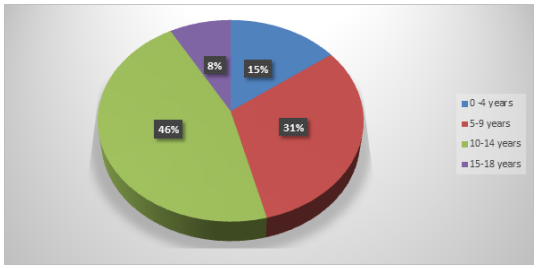

Figure 2. Age-wise Distribution of Cases

Grading of thrombocytopenia according to platelet count is done in Table 3. Plate count was done by automated 5 cell counter and confirmed by peripheral blood smears.

Table 3. Severity of Thrombocytopenia

S. No.	GRADE	NO. OF CASES	Percentage (%)
1.	75-150	480	48%
2.	50-75	250	25%
3.	25-50	200	20%
4.	<25	70	7%
	Total	1000	100

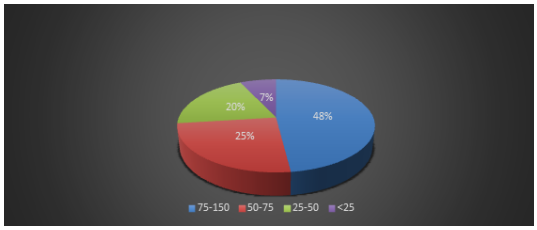

Figure 3. Severity of Thrombocytopenia Grade-wise

The Severity of Thrombocytopenia was found highest in 48% cases with Grade 75-150 followed by in 25% cases with Grade 50-75. Clinical presentation of patient with thrombocytopenia predominantly showed fever (98%) and myalgia (98%) followed by abdominal pain (90%) and vomiting (90%) along with other clinical features as shown in Table 4 and Figure 4. Among bleeding complaints, nose bleeding is more common than other kind of bleeding such as Malena, Subconjunctivalhaemorrhage.

Table 4. Clinicalpresentationof patients with thrombocytopenia

S.No.	Clinical features	Patient having thrombocytopenia
1.	Fever	98%
2.	Myalgia	98%
3.	Abdominal pain	90%
4.	Vomiting	90%
5.	Arthralgia	60%
6.	Rash	50%
7.	Jaundice	10%
8.	Nose (Gum bleeding)	10%
9.	Seijures	04%
10.	Hematuria	01%
11.	Sub-Conjuctival Hemorrhage	01%
12.	Malena	01%
13.	Erythema	01%

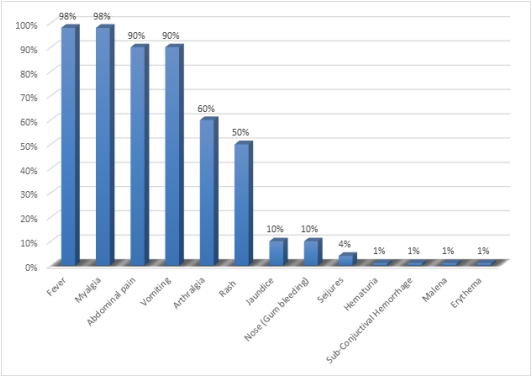

Figure 4. Clinical presentation of patients with thrombocytopenia

5. Discussion

Thrombocytopenia is defined as a platelet count less than 1.5 lac/mm3 and is most commonly seen in febrile conditions. Similarly, in our study, thrombocytopenia was most commonly seen in patients with infections. Among infections, dengue was the most common cause of thrombocytopenia, a finding consistent with the study done by Bhalara et al.[13].

Our study identified dengue as the most common infection causing thrombocytopenia, followed by sepsis, leptospirosis, scrub typhus, and then malaria. This differs from the findings of a study by Puromit et al., which showed malaria as the most common cause of thrombocytopenia followed by dengue [14].

Our study focused on patients under 18 years of age, and we found that thrombocytopenia was most commonly seen in the 10-14 years age group, similar to the study done by Kumar M et al., where younger patients showed a higher prevalence of thrombocytopenia than adults [15].

Males were found to be more predisposed to thrombocytopenia than females in our study, consistent with the findings of the study by Bhalara et al., [13]. However, it should be noted that the citation for this finding is missing.

Thrombocytopenia can be classified further based on severity, but there is no standard classification for mild, moderate, severe, and very severe thrombocytopenia. In our study, the most commonly seen type was

mild thrombocytopenia (platelet count of 75-1.5), followed by moderate (50-75), severe (25-50), and very severe (<25,000).

Regarding clinical manifestations, our study found that fever and myalgia were the most common symptoms, while bleeding manifestations were less common. These findings are consistent with the study by Naikwadi MA et al., which showed fever to be the most common clinical feature in thrombocytopenia [16].

6. Conclusion

After analyzing the study, it is crucial to emphasize the need for proper evaluation and management of childhood patients presenting with fever and thrombocytopenia. The increasing incidence of dengue cases worldwide underscores the importance of conducting a thorough workup to prevent morbidity and mortality in affected patients.

Furthermore, given that severe thrombocytopenia is a strong predictor of bleeding manifestations, timely diagnosis and treatment are critical. Platelet transfusion should be considered as an essential intervention to prevent life-threatening complications.

In conclusion, healthcare professionals must be aware of the various causes of fever with thrombocytopenia and be equipped to promptly diagnose and manage these patients to improve clinical outcomes

Conflicts of Interest: The authors declare no conflict of interest.

References

[1] Paramjit, E., Rao, R., Sudhamani, S., Roplekar, P., Shaffi, Z., & Roy, S. (2016). Spectrum of thrombocytopenia: A clinicopathological study with review of the literature. Muller Journal of Medical Sciences and Research, 7, 121-124.

[2] Ambruso, D. R., Hays, T., & Goldenberg, N. (2007). Hematologic disorders in current pediatric diagnosis and treatment 18th edition a Lange medical books/McGraw-Hill (pp. 860-862).

[3] Handian, R. I. (2001). Bleeding and thrombosis. In Braunwald et al (Eds.), Harrison Principles of Internal Medicine, 15th Ed. Vol.1 (pp. 358). USA: McGraw Hill.

[4] Gutthi, L. P., Vegesna, S., Naikwadi, V., Pundarikaksha, K., Kolla, S., Gundapaneni, M., & Karimi, P. K. (2017). A study of clinical and lab profile of fever with thrombocytopenia. International Journal of Contemporary Medical Research, 6(7), 2393-915X.

[5] Levine, S. P. (1999). Miscellaneous causes of thrombocytopenia. In Richard Lee G. et al (Eds.), Wintrobe's clinical hematology, 10th Ed. Vol.2 (pp. 1627-1629). Baltimore: Williams and Wilkins.

[6] Nair, P. S., Jain, A., Khanduri, U., & Kumar, V. (2003). A study of fever associated with thrombocytopenia. Journal of the Association of Physicians of India, 51, 1173.

[7] Ziedins, K. B., Orfeo, T., Jenny, N. S., Everse, S. J., & Mann, K. G. (2003). Blood Coagulation and Fibrinolysis. In J. P. Greer, J. Foerster, J. N. Lukens, G. M. Rodgers, & F. Paraskevas (Eds.), Wintrobe's Clinical Hematology (11th ed., pp. 1332-1546). London: Lippincott Williams & Wilkins Publishers.

[8] Dash, H. S., Ravikiran, P., & Swarnalatha, G. (2013). Study of Clinical and Laboratory Profile of Fever with Thrombocytopenia and Its Outcome During Hospital Stay. IJSR, 2, 445-447.

[9] Gandhi, A. A., & Akholkar, P. J. (2015). Clinical and laboratory evaluation of patients with febrile thrombocytopenia. NJMR, 5, 43-46.

[10] Raikar, S. R., Kamdar, P. K., & Dabhi, A. S. (2014). Clinical and laboratory evaluation of patients with fever with thrombocytopenia. IJCP, 24, 360-363.

[11] Naikwadi, A. M., & Anjum, S. N. (2019). Study of clinical and laboratory profile of fever with thrombocytopenia in tertiary hospital. International Journal of Contemporary Medical Research, 6(7), G35-G38.

[12] O'Brien, D., Tobin, S., Brown, G. V., & Torresi, J. (2001). Fever in returned travelers: Review of hospital admissions for a 3-year period. Clinical Infectious Diseases, 33, 603-609.

[13] Bhalara, S. K., Shah, S., Goswami, H., & Gonsai, R. N. (2015). Clinical and etiological profile of thrombocytopenia in adults: A tertiary-care hospital-based cross-sectional study. International Journal of Medical Science and Public Health, 4, 7-10.

[14] Pramjit, E., Rao, A. R., Sudhamani, S., Roplekar, P., Shaffi, Z., & Roy, S. (2016). Spectrum of thrombocytopenia: A clinicopathological study with review of the literature. Muller Journal of Medical Sciences and Research, 7, 121-124.

[15] Manoj Kumar, Rajesh Kumar Verma, Suchitra Nirjhar, & Monika Singh. (2020). Prevalence of depression and its associated factors among elderly: A cross-sectional study in an urban community. Journal of Family Medicine and Primary Care, 9(1), 293-297.

[16] Aman M. Naikwadi & Sayyad Nikhat Anjum. (2019). Study of clinical and laboratory profile of fever with thrombocytopenia in a tertiary hospital. International Journal of Contemporary Medical Research, 6(7), 208-211.