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Original Research Article

Clinical profile and outcome of fever with thrombocytopenia among children admitted at tertiary care hospital

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ABSTRACT

Background: Fever with thrombocytopenia is a common yet potentially serious clinical entity in paediatric patients in tropical countries, frequently associated with infections such as dengue, scrub typhus, enteric fever and septicaemia. This study aimed to describe the clinical profile and outcomes of such patients at a tertiary care hospital.
Methods: A prospective observational study was conducted over 18 months (July 2023 to January 2025) in children aged 1 month to 12 years admitted with fever and thrombocytopenia. A total of 260 patients were enrolled using simple random sampling. Clinical data, laboratory investigations, treatment details and outcomes were recorded. Statistical analysis used SPSS version 16 (Chi-square test, Student's t-test; $p<0.05$ considered significant).
Results: The 6–10 years age group was most affected (40%), with male predominance (55%). Most participants were rural residents (65%) and admissions peaked during the monsoon (40%). Dengue fever (30%) was the most common identified aetiology; 46% remained undiagnosed. Severe thrombocytopenia was found in 47%. Overall mortality was 6.2%. Lower platelet counts ($p<0.001$), bleeding manifestations ($p<0.002$) and aetiologies of septicaemia and viral encephalitis ($p=0.04$) were significantly associated with mortality.
Conclusions: Dengue and scrub typhus are the predominant identified aetiologies. Low platelet counts, bleeding manifestations, septicaemia and viral encephalitis are significant predictors of poor outcomes. Early recognition and prompt targeted management are vital to reducing morbidity and mortality in paediatric febrile thrombocytopenia.

Keywords: Clinical profile, Dengue, Fever, Outcome, Paediatric, Thrombocytopenia

INTRODUCTION

Fever with thrombocytopenia is a frequently encountered and clinically significant presentation in paediatric wards, particularly in tropical regions. Thrombocytopenia, defined as a platelet count below 150×10^9/l in the presence of fever, poses a diagnostic challenge given the wide spectrum of aetiologies spanning infectious, immune-mediated and haematological conditions.[1,2] In tropical and subtropical countries like India, infections including dengue fever, scrub typhus, enteric fever, malaria, leptospirosis and septicaemia are common causes of febrile thrombocytopenia, with a well-recognised seasonal peak during the monsoon. The clinical course varies widely from mild, self-limiting illness to life-threatening haemorrhagic complications necessitating intensive care.[3,4]

Children may present with petechiae, epistaxis, gum bleeding, gastrointestinal haemorrhage, or intracranial bleeding. Risk correlates strongly with platelet count severity; counts below 20,000/mm³ carry significant risk of spontaneous bleeding.[5,6] Despite its clinical importance, comprehensive paediatric studies from tertiary care centres in Central India are limited. This study was therefore undertaken to describe the clinical profile and outcomes of fever with thrombocytopenia among children admitted to a tertiary care hospital,

aiming to assist in early diagnosis, risk stratification and optimisation of management.

METHODS

Study design and setting

This was a prospective observational study conducted in the Department of Paediatrics, Dr. Shankarrao Chavan Government Medical College and Hospital, Vishnupuri, Nanded, Maharashtra, India, a tertiary care teaching hospital in Central India. The study was carried out over a period of 18 months, from July 2023 to January 2025, following Institutional Ethics Committee approval.

Study population and sample size

Children aged 1 month to 12 years admitted with fever (≥38°C) and thrombocytopenia (platelet count <150×10⁹/l) were enrolled using simple random sampling. Sample size was calculated assuming a mortality rate of 18%, confidence limit of ±5% and design effect of 1 (formula: n=4Pq/l²), yielding a minimum of 236, rounded to 260 with a 10% buffer.

Inclusion and exclusion criteria

Children aged 1 month to 12 years with fever and thrombocytopenia, with valid written parental/guardian consent were included. Refusal of consent; previously diagnosed haematological malignancy; children on anti-platelet medications were excluded.

Data collection

All enrolled patients underwent detailed history-taking, clinical examination and investigations including CBC, liver function tests (SGOT, SGPT, serum bilirubin), renal function tests (creatinine, BUN) and targeted serology/cultures as clinically indicated (dengue NS1/IgM, Weil-Felix for scrub typhus, blood cultures, etc.). Thrombocytopenia was graded as mild (100,000–150,000/mm³), moderate (50,000–100,000/mm³), or severe (<50,000/mm³).

Statistical analysis

Data were entered in Microsoft Excel and analysed using SPSS version 16. Frequencies, percentages, means and standard deviations were computed. Chi-square test and Student's t-test were used for comparisons. A p value <0.05 was considered statistically significant.

RESULTS

Demographic characteristics

A total of 260 children were enrolled. The 6–10 years age group was most prevalent (40%, n=104), followed by 1–5 years (30%, n=78), 11–12 years (20%, n=52) and <1 year (10%, n=26) (Table 1). Males comprised 55% (n=143) and females 45% (n=117). Rural residents constituted 65% (n=169). Admissions peaked during monsoon (June–September: 40%, n=104), followed by post-monsoon (30%, n=78), with winter and summer equally contributing 15% each.

Clinical presentation

All participants (100%) presented with fever. Abdominal pain (65%), myalgia/arthralgia and vomiting (40% each), pallor (35%), rash (32%) and hepatomegaly (28%) were common (Table 2). Among bleeding manifestations, malaena was most common (20%, n=52), followed by petechiae/purpura (10%, n=26), gum bleeding (7%) and epistaxis and haematemesis (6% each). Compensatory shock was present in 37% (n=96) at admission, narrow pulse pressure in 30% (n=78) and hypotensive shock in 4% (n=10). Fever lasted 4–7 days in 50% of patients.

Laboratory profile

The mean platelet count was 75±30×10⁹/l (range 50–100). Mean haemoglobin was 10.5±1.5 g/dl, total leukocyte count 8.0±3.0×10⁹/l, SGOT 26.40±7.74 IU/l, SGPT 27.65±7.00 IU/l and mean length of hospital stay 5±2 days (Table 3).

Aetiology and grades of thrombocytopenia

Dengue fever was the most common identified aetiology (30%, n=79), followed by scrub typhus (16%, n=41), enteric fever (5%, n=14), septicaemia (2%, n=6) and viral encephalitis (1%, n=3). A substantial 46% (n=117) remained undiagnosed (Table 4). Severe thrombocytopenia was present in 47% (n=124), moderate in 43% (n=110) and mild in 10% (n=26) (Table 5). The association between aetiology and grade of thrombocytopenia was statistically significant (χ^2=12.11, p=0.015).

Treatment, outcomes and associations

All patients received antipyretics (100%). Intravenous fluids were given to 90% (n=234), antimicrobials to 85% (n=221), FFP to 57% (n=150) and platelet transfusions to 47% (n=120). Inotropic and ventilatory support were required in 12% and 8% respectively. Overall, 92.3% (n=240) were discharged improved. Total mortality was 6.2%: 1.2% (n=3) died within 24 hours and 5% (n=10) after 24 hours (Table 6).

Significant bleeding (n=58, 22.3%), shock (5.8%) and secondary infections (5.8%) were the most common complications. Platelet count was significantly associated with outcome (p<0.001): 10 deaths in the <50×10⁹/l group vs. zero in the 100–<150×10⁹/l group (Table 7).

Presence of bleeding manifestations was also significantly associated with mortality (p<0.002).

Aetiology significantly influenced outcome (p=0.04): septicaemia carried 67% mortality (4/6) and viral encephalitis 100% mortality (3/3), while scrub typhus and enteric fever had zero mortality.

Table 1: Age, gender and residence distribution of study participants (n=260).

Parameters	Category	Frequency (N)	(%)
Age group (in years)	<1	26	10
	1–5	78	30
	6–10	104	40
	11–12	52	20
Gender	Male	143	55
	Female	117	45
Residence	Rural	169	65
	Urban	91	35

Table 2: Key clinical findings at admission (N=260).

S. no.	Clinical finding	Frequency (N)	(%)
1	Fever	260	100
2	Abdominal pain	169	65
3	Myalgia/arthralgia	104	40
4	Vomiting	104	40
5	Pallor	91	35
6	Rash	80	32
7	Hepatomegaly	76	28
8	Petechiae	55	22
9	Splenomegaly	39	15
10	Malaena (bleeding)	52	20

Table 3: Laboratory profile of study participants (n=260).

S. no.	Parameter	Mean±SD	Range
1	Platelet count (×10⁹/l)	75±30	50–100
2	Haemoglobin (g/dl)	10.5±1.5	7.0–13.0
3	Haematocrit	34.8±14.0	14–48
4	TLC (×10⁹/l)	8.0±3.0	3.0–20.0
5	Neutrophils (%)	55±10	30–80
6	SGOT (IU/l)	26.40±7.74	12–52
7	SGPT (IU/l)	27.65±7.00	14–46
8	Creatinine	0.67±0.20	0.4–2.0
9	BUN (mg/dl)	23.97±7.88	15–54
10	Hospital stays (in days)	5±2	3–7

Table 4: Aetiology of fever with thrombocytopenia (n=260).

S. no.	Aetiology	Frequency (N)	(%)
1	Undiagnosed/unidentified	117	46
2	Dengue fever	79	30
3	Scrub typhus	41	16
4	Enteric fever (typhoid)	14	5
5	Septicaemia	6	2
6	Viral encephalitis	3	1
	Total	260	100

Table 5: Grades of thrombocytopenia among study participants (n=260).

S. no.	Grade of Thrombocytopenia	Frequency (N)	(%)
1	Mild (100,000–150,000/mm³)	26	10
2	Moderate (50,000–100,000/mm³)	110	42
3	Severe (<50,000/mm³)	124	47
	Total	260	100

Table 6: Clinical outcome of study participants (n=260).

S. no.	Outcome	Frequency (N)	(%)
1	Discharged–improved	240	92.3
2	Discharged–against medical advice	05	1.9
3	Transferred to another facility	02	0.8
4	Death–within 24 hours	03	1.2
5	Death–after 24 hours	10	5.0
	Total	260	100

Table 7: Association of platelet count with clinical outcome (n=260).

Platelet counts (×10⁹/l)	Discharged improved (n=240)	Death (n=13)	P value
<50	112	10	<0.001
50–<100	107	03	
100–<150	21	00	

DISCUSSION

The present study provides a comprehensive clinical profile of fever with thrombocytopenia in 260 paediatric patients at a tertiary care centre in Central India. The 6–10 years age group was most affected (40%), with a male preponderance (55%). This is consistent with Tamil Selvan et al, who reported the same age group as most prevalent (35.5%) with male predominance in a cohort of 276 patients.[7] Higher outdoor exposure among school-age children likely increases susceptibility to vector-borne illnesses. Rural residency (65%) and monsoon-peak admissions (40%) were notable findings. Nair BT et al, (2017) similarly reported monsoon predominance (46.11% from July–September) and a disproportionate rural burden, consistent with the ecological drivers of vector-borne disease transmission.[8] Abdominal pain (65%) was more prevalent than reported by Gandhi et al who found it in 16.11% of 180 cases.[9] Compensatory shock in 37% underscores the severity of presentations at this referral centre. Malaena (20%) as the most common bleeding manifestation likely reflects the predominance of dengue with gastrointestinal involvement.

The mean platelet count of 75±30×10⁹/l with 47% severe thrombocytopenia correlates with Ten Cate et al who reported up to 44% severe thrombocytopenia in dengue-specific cohorts.[10] Dengue fever (30%) was the leading identified aetiology, though lower than Ramabhatta et al who found dengue in 83% of their series.[11] The high undiagnosed proportion (46%) likely reflects limitations in diagnostic testing availability and highlights an area for healthcare infrastructure improvement. The 6.2% overall mortality was comparable to Kroll et al who reported 6% mortality in 100 patients.[12] Critically, low platelet counts, bleeding manifestations, septicaemia and viral encephalitis were significant predictors of death. Viral encephalitis carried 100% in-hospital mortality (3/3) and septicaemia 67% (4/6), identifying these as high-risk subgroups requiring aggressive and early intervention.

This study has several limitations. Being a single-centre observational study, the findings may not be generalisable to other geographical settings or patient populations. A high proportion of cases (46%) remained aetiologically undiagnosed, limiting precise analysis of causative associations. The study focused solely on in-hospital outcomes, with no long-term follow-up data on recovery, readmission rates, or post-discharge sequelae. Additionally, the absence of a control group (e.g., febrile children without thrombocytopenia) precluded causal inferences regarding the specific impact of thrombocytopenia on outcomes.

CONCLUSION

Fever with thrombocytopenia in children is a clinically significant and potentially life-threatening condition predominantly affecting the 6 to 10-year age group, with a male preponderance and a strong rural and monsoon-season predisposition. Dengue fever and scrub typhus accounted for the majority of identified aetiologies, while nearly half of the cases remained undiagnosed, reflecting the diagnostic challenges in resource-limited settings. Severe thrombocytopenia was observed in nearly half of all patients and the overall mortality was 6.2%. Platelet count below 50×10⁹/l, presence of bleeding manifestations, septicaemia and viral encephalitis were identified as significant predictors of adverse outcome. These findings underscore the importance of early clinical recognition, prompt haemodynamic stabilisation, targeted antimicrobial therapy and judicious use of blood products in improving outcomes in paediatric febrile thrombocytopenia.

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