



**ORIGINAL RESEARCH PAPER**

**Paediatrics**

**COMMON ETIOLOGY OF ACUTE FEVER WITH THROMBOCYTOPENIA IN A CHILDREN WEST RAJASTHAN.**

**KEY WORDS:** Fever, thrombocytopenia, bleeding, malaria, dengue.

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**ABSTRACT**

**BACKGROUND:** Acute fever with thrombocytopenia is a common problem with increased mortality and morbidity if not diagnosed and treated properly in time. Infection is the commonest cause of thrombocytopenia, thrombocytopenia associated with fever helps to narrow the differential diagnosis and management of fever. Common causes such as malaria Unspecified fevers, dengue, chikungunya, enteric fever, septicemia, leptospirosis, rickettsial infections, typhoid, borreliosis, arbovirus such as dengue or yellow fever, swine flu, rodent-borne viruses such as Hanta and Lassa fever, human immunodeficiency virus (HIV).

**Materials and Methods:** A total of 300 patients who were admitted to Pediatric department Govt hospital Barmer Rajasthan India during June 2015 to November 2016 were retrospectively studied.

**Results:** Most common cause was malaria followed by unspecified fevers. Only 20 patients had bleeding with thrombocytopenia. Major incidence manifestation occur whose platelet count was in range below 10000/uL.

**Conclusion:** Fever with thrombocytopenia is a very common problem. malaria were the most common followed by Unspecified fevers and dengue then sepsis. There are only few studies which focus the thrombocytopenia in patient with fever. therefore well-structured approach that is conducted with awareness of different cause of fever with thrombocytopenia steamlines the different diagnosis and determine etiology.

**INTRODUCTION:**

In the recent period, there is an upsurge in the number of patient with fever and thrombocytopenia. This may be due to several emerging and reemerging infection in the recent period.

Fever is defined as an elevation of the body temperature above the normal circadian range as the result of a change in the thermoregulatory center located in the anterior hypothalamus.

An AM temperature of >37.2°C (98.9°F) or a P.M. temperature of >37.7°C (99.9°F) would define fever. [1] Thrombocytopenia is defined as platelet count <1,50,000/μL. This is due to decreased production, increased destruction (immunogenic and non-immunogenic), and increased sequestration in spleen. Of these infections being the commonest cause of thrombocytopenia. (2,3)

Fever with thrombocytopenia is commonly encountered by physicians especially during monsoon and perimonsoon period. Infections with protozoa, bacteria and viruses can cause thrombocytopenia with or without disseminated intravascular coagulation. Occasionally these patients can go on to develop a stormy course with multiorgan dysfunction requiring intensive care unit admission associated with high morbidity and mortality.

Infections cause decrease in platelet count both due to effects on platelet production and platelet survival. Thrombocytopenia in bacterial infections can occur as a part of sepsis with disseminated intravascular coagulation. Patients with sepsis may also develop hemophagocytic histiocytosis with phagocytosis of platelets and leucocytes in the bone marrow histiocytes. Both Gram-positive and Gram-negative bacterial infections can lead to sepsis. Elevated platelet-associated IgG has been implicated. Platelets tend to adhere to damaged vascular surfaces in meningococemia.

Viruses thrombocytopenia by various mechanisms like impaired platelet production as a result of direct viral invasion, toxic effect of viral proteins on thrombopoiesis, virus-induced hemophagocytosis and increased platelet destruction caused by binding of virus-induced autoantibodies or viral-antigen antibody complexes.

Thrombocytopenia in dengue infection raises concern about bleeding risk. Bone marrow suppression by virus and peripheral destruction of platelets have been implicated. Platelet transfusions are not routinely recommended in the management of Dengue fever.

Thrombocytopenia during malarial infection may appear even before fever, anemia and splenomegaly become manifest. Immune-mediated lysis, sequestration in the spleen and a dyspoietic process in marrow with diminished platelet production have all been postulated. During early stages of malaria, platelet agglutination as a result of endothelial cell activation and release of activated von Willebrand factor occurs which may cause thrombocytopenia. Occasionally platelets can be invaded by malarial parasites. Thrombocytopenia in malaria is rarely severe and treatment is focussed on eradication of malarial parasite.

According to recent guidelines by the World health organization and National Vector-borne Diseases Control Programme prophylactic transfusion of platelets is not indicated unless the patient has bleeding or a count of less than 10000/cumm.

Though thrombocytopenia is encountered in various diseases, it is for sure that potentially fatal bleeding due to thrombocytopenia is rare. (4)

**MATERIALS AND METHODS :**

The study was conducted on A total of 300 patients who were admitted to Pediatric Department Govt hospital Barmer Rajasthan India.

All the patients 1month to 18 year of age. All the patients presenting with the complaints of fever. (>99.9degoF) with thrombocytopenia. (less than 1,50,000/μL) .

Exclusion Criteria a. Patients less than 1month and more than 18 years of age. Patients with fever with thrombocytopenia other than infective etiology like immune thrombocytopenia, drug-induced thrombocytopenia, hemolysis, elevated liver enzymes and low platelets, myeloproliferative diseases, disseminated intravascular coagulation of non-infective etiology (abruptio placentae, snake bite), Patients with chronic liver disease .Patients with autoimmune diseases.

Informed Consent was obtained and a perma based Study Design Retrospective study.

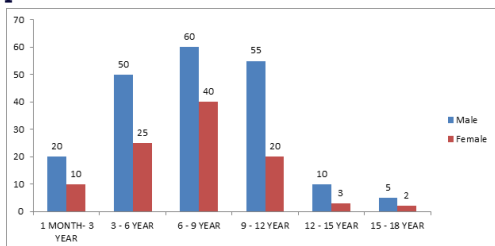
Statistical Method: Data collected will be analyzed by frequency, percentage, mean, standard deviation, and Chi-square test.

**RESULTS:**

1. Age and Sex Distribution In our study, a total of 300 cases were selected as per the criteria. Out of the 300 cases 200 were males and 100 were females. The cases included in the study were divided into age group.

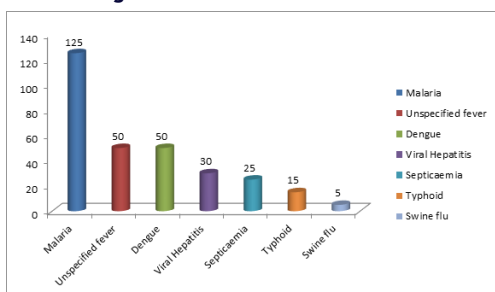
30 cases age group of 1moth-3 years, 75 in age group of 3-6years, 100 in age group of 6-9years,75 in age group of 9-12years, 13 in age group of 12-15 years, 7 in age group of 15-18 years. The maximum cases were found to be in age group of 6-9 years.(Figure1)

**Figure 1: Age and Sex Distribution at thrombocytopenia**



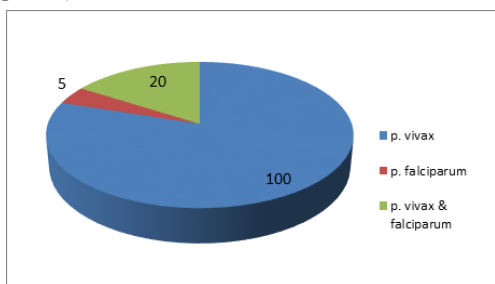
2. Etiological Distribution In the 300 cases fever with thrombocytopenia, all of them had a Malaria 125 (41.66%), Unspecified fevers 50(16.6%), dengue 50 (16.6%), Viral Hepatitis 30 (10%), septicaemia 25 (8%), Typhoid 15 (5%), swine flu 5(1.6).(figure2)

**Figure2: Etiological Distribution**

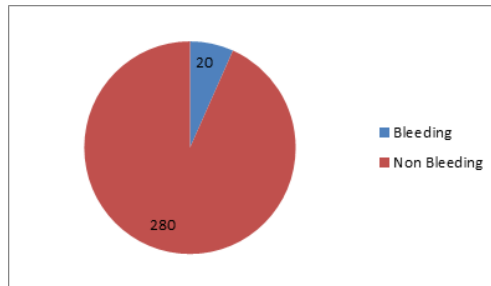


**Figure3: cases plasmodium species**

P. vivax was the commonest Plasmodium species with 100, followed by P. falciparum 5, and mix type (P. vivax and P. falciparum) 20.



In our study, 300 patients were admitted 20 Distribution on basis of pattern of Bleeding Tendency Among the cases which had a bleeding manifestations, epistaxis(10) was the most common presentation, followed by petechiae/ purpura(5) ,haematemesis(3), malena(1) and (1) had hematuria.



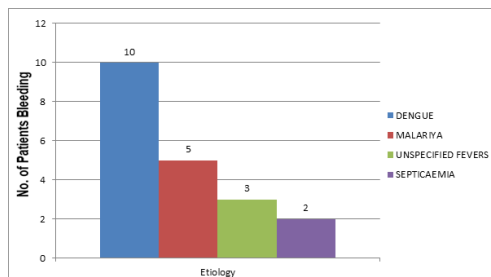
**Figure4: Patient with bleeding manifestations**

**Table 1:**

Distribution on the basis of platelet count and bleeding manifestations Out of the 20 cases who had bleeding manifestations, 10 patients had platelet count below 10000/ $\mu$ L, 5 patients had platelet count between 11000 to 20000/ $\mu$ L, 3 had between 21000/ $\mu$ L to 50000/ $\mu$ L, 2 had platelet count above 50000/ $\mu$ L.

Platelet count	Total patients	bleeding manifestations
below 10000/ $\mu$ L	10 (3.33%)	10 (3.3%)
between 11000 to 20000/ $\mu$ L	10 (3.33%)	5 (1.6%)
between 21000/ $\mu$ L to 50000/ $\mu$ L	50 (16.6%)	3 (1%)
above 50000/ $\mu$ L	230 (76.6%)	2(0.6%)

Distribution according to Etiology and Bleeding Tendency Out of the 20 cases, 10 case of dengue, 5 cases of malaria had bleeding manifestations, 2 cases of septicaemia, Unspecified fevers 3 had bleeding manifestations had bleeding manifestations.



**Figure5: Etiology and Bleeding Tendency**

**PROGNOSTIC FINDINGS**

1. Mortality Out of the 300 cases, 298 cases had complete recovery and were discharged while 2 patients expired during their period of hospital stay.
2. Mortality as seen with Etiology In the present study, in the cases of septicaemia, we had 1 mortalities and one had in dengue cases.

**DISCUSSION:**

Acute fever with thrombocytopenia is a very common problem faced by all physicians day to day in medical wards. When diagnosis is made properly and treated, early results are good.

Malaria was the commonest cause accounting 125(41.66%), followed by Unspecified fever fevers 50(16.6%) and dengue 50(16.6%) then Viral Hepatitis 30(10%), septicaemia 25 (8%), Typhoid 15 (5%), swine flu 5(1.6).

In a study by Lohitashwa Srinivas et al<sup>4</sup> on 100 patients from March 2004 to September had similar observation (i.e., malaria being the commonest cause). Another prospective study, which was conducted on 228 patients with fever and thrombocytopenia in medical unit of Hayat Abad Medical Complex during 2008-2010<sup>5</sup> was showing malaria as a commonest cause (53%) out of which 68% were having

falciparum malaria. Malaria is commonly accompanied by mild-to moderate thrombocytopenia in 40.53-85% (78.4% by Jadhav et al<sup>6</sup>, 80.6% by Medical Unit 3, JPMC, Karachi, 85.5% by Shaikh et al<sup>6-9</sup>). In an observational study conducted by Malik et al<sup>9</sup> at Karachi on endemicity of malaria and hematological finding in Gadap region on 392 patients observed malarial prevalence in 11.72%, out of which thrombocytopenia was observed in 70% cases.

In Nair et al<sup>10</sup> study septicemia with 29 cases was the leading cause of fever associated with thrombocytopenia. Second common cause was enteric fever 16 followed by dengue 15, Megaloblastic anaemia 13, malaria 10, Haematological malignancy with 4 cases respectively.

In Srinivas et al<sup>4</sup> study malaria with 41 cases was the leading cause of fever associated with thrombocytopenia. Second common cause was enteric fever followed by septicemia, dengue, leptospirosis with 24, 19, 2 cases respectively.

Raiker et al<sup>11</sup> study dengue(52%), malaria(42%), enteric fever(3%), no specific viral fever(4.5%). Study conducted by Gandhi et al<sup>12</sup> malaria(42%), dengue(26%) and other viral fever(17%).

**Table 2 : Compare study fever with thrombocytopenic cases.**

Disease	Present study(%)	Srinivas et al <sup>1</sup> (%)	Nair et al <sup>2</sup> (%)	Suneetha et al <sup>13</sup> (%)	Patil et al <sup>14</sup> (%)	Dash et al <sup>15</sup> (%)
Malaria	41.66	41	9.2	8.6	54	45
Dengue	16.6	14	13.8	46.6	15	20
Enteric fever	5	21	14.7	2	6	10
Other	36.74	24	62.3	42.8	25	25

Even though the m In the present study there were 15 cases of malaria, out of which plasmodium falciparum are 4 cases, plasmodium vivax are 10 cases and mixed infections are 1 case compared to Nair study there were 41 cases of malaria, out of which plasmodium falciparum 13, plasmodium vivax 20 cases and mixed infection were 8 cases.

**Table 3: Comparison of distribution of malaria parasites.**

Plasmodium species	Present study	Nair et al <sup>10</sup>	Suneetha et al <sup>13</sup>
P.Vivax	100(80%)	20(40%)	10(66.67%)
P.Falciparum	5(4%)	13(32%)	04(26.66%)
Mixed	20(16%)	08(20%)	01(6.6%)

In our study distribution of platelet counts in the range of more than 50000/ $\mu$ L was seen in 230(76.6%) cases as compared to 62(56.8%) cases in study by Nair et al<sup>10</sup>. and compare to Suneetha et al<sup>13</sup> 15 (15%)

**Table 4 : platelet count comparison with other studies.**

Platelet count			
Distribution of platelets count in thousand	Present study	Nair et al <sup>10</sup>	Suneetha et al <sup>13</sup>
<10	10 (3.33%)	19 (17.5%)	3 (3%)
<11-20	10 (3.33%)		3 (3%)
<21-50	50 (16.6%)	28 (25.7%)	15 (15%)
>50	230 (76.6%)	80 (40%)	78 (78%)

Platelet counts in the range of 21000-50000/ell was seen in 50 (16.6%) cases in our study as compared to 28(25.7%) in the studies by Nair et al<sup>10</sup> respectively and compare to Suneetha et al<sup>13</sup>

Platelet counts less than 10000/ $\mu$ L was seen in 10 (3.33%) cases in our study as compared to 19(17.5%) in the 15 (15%) study by Nair et al<sup>10</sup> and compare to Suneetha et al<sup>13</sup> (3%)

In conclusion, >50000/ $\mu$ L was the commonest range for the

distribution of cases in our study of fever with thrombocytopenia.

**CONCLUSION :**

Fever with thrombocytopenia is a very common problem. It is indeed a very good attempt to develop a scoring system as it can not only guide the clinician but also help avoid unnecessary transfusions with all the associated risks and burdening the blood banks. However as the authors also point out, there are several limitations of this study. In this study 16.6% cases was Unspecified fever, we could not find a definitive cause, it may be due to the limited screening facility available for other infection cause fever with thrombocytopenia.

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