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STUDY OF SIGNIFICANCE OF PLATELET COUNT IN FEVER CASES

G. Vasavilatha[1], A. K. Murthy[2], P. Kranthi[3], M. Chandrashekhar[4]

ABSTRACT: AIM: To study the significance of platelet count in various fevers and also identify the common causes of fever with thrombocytopenia. **MATERIALS AND METHODS:** 69 patients who were admitted with fever over 2 months of period from 15th October to15th December 2014 in King George Hospital AMC Visakhapatnam studied retrospectively. **RESULTS: INCIDENCE:** More than half of the cases (52.2%) admitted with fever have thrombocytopenia. **SEX:** The study reveals that irrespective of sex and size of the sample the presentation of fever with/ without thrombocytopenia could not found any significant difference. Degree of thrombocytopenia in various etiologies: in the present study it is found that out of 15 cases of falciparum malaria 10 cases had thrombocytopenia. Out of 12 undiagnosed cases 8 cases had thrombocytopenia. Out of 4 cases of gastro intestinal system 3 cases had thrombocytopenia. In the present study it is significantly found that the highest difference is noticed in the presentation of dengue cases. Out of total sample (69) cases it is found that 5cases (7.2%) of thrombocytopenia with dengue fever were found against 1case (1.4%) of dengue fever with normal plate let count. The present study reveals that there is significant difference among various diseases such as malaria 14 (16.6%), dengue fever 5 (13.9%), Urinary tract infection 2 (5.6%), undiagnosed cases 8 (22.2%). However severe thrombocytopenia (platelets less than 50,000) is seen in14 cases (38.8%)out of 36 cases of fever with thrombocytopenia. Further this study reveals that in the cases of malaria 50% of cases reported as severe thrombocytopenia 7cases (19.4%) followed by dengue fever3 cases (8.3%). **CONCLUSION:** Not only malaria, dengue fever and urinary tract infection can also cause severe thrombocytopenia. Fever cases especially with thrombocytopenia show seasonal variations, they are seen commonly in early winter. Febrile thrombocytopenia still presents as atypical and occult forms making diagnosis difficult. This highlights the importance of thrombocytopenia in various febrile disorders. Hence, there is a need for study to know the importance of platelet count estimation in all types of fever as a basic investigation to establish correct diagnosis and prevent fatal outcome.
KEYWORDS: fever, platelet count malaria, dengue, urinary tract infection, seasonal variation.

INTRODUCTION: Fever is the most challenging problem in the field of medicine, consists of occult manifestation of common diseases rather than rare diseases. Fever has been recognized as a cardinal manifestation of diseases since ancient times, as recorded by ancient scholars like HIPPOCRATES,[1] an AM temperature of more than 37.2 degrees Celsius (98.9 degrees Fahrenheit) or PM temperature of more than 37.7 degrees Celsius (98.9 degrees Fahrenheit) would define fever.[2] Most of the diseases like dengue, leptospirosis, malaria, typhoid, military TB, HIV, septicemia are associated abnormal platelet levels (Less than 1.5 lakhs).[3] Even though malaria is endemic throughout the tropics, dengue has higher fatality rate that is above 1% over the last 10 years. Therefore a well-organized systemic approach that is carried out with an awareness of causes of fever with thrombocytopenia narrows the differential diagnosis of the clinical entity and brings out diagnosis. Thrombocytopenia correlates

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inversely with mortality and morbidity in various febrile illnesses. Serial monitoring of platelet count has prognostic value. All febrile illness cases should be investigated for platelet count whether they have bleeding manifestations or not. This highlights the importance of thrombocytopenia in various febrile disorders[4]. Hence needs for study to know the importance of platelet count estimation in all types of fever as a basic investigation to establish correct diagnosis and prevent fatal outcome.

AIM: To study the significance of platelet counts in various fevers.

METHODS: Sample was collected retrospectively from cases admitted in King George Hospital Visakhapatnam with fever as presenting complaint over a period of two months-time (15th October 2014 -15th December 2014).Detailed history noted, cases analyzed for various parameters like platelet count, QBC, and other lab investigations. Age, sex, complications and mortality were noted.

INCLUSION CRITERIA: both sexes aged more than12years who were admitted with fever in medical wards during 15th October -15th December 2014 was included.

EXCLUSION CRITERIA: both sexes aged less than 12years, no fever but abnormal platelet counts were excluded.

RESULTS:

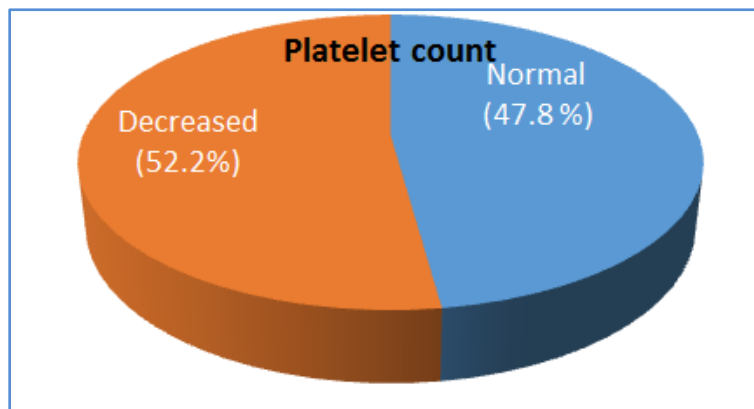| Platelet count	No. Of patients	percentage
Normal	33	47.8
Decreased	36	52.2
Total	69	100
Table 1: Distribution according to Platelet count in cases of fever		

Fig. 1: Distribution according to Platelet count in cases of fever

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In the present study, among the 69 patients presented with fever 33 patients (47.8%) had normal platelet count and 36 patients (52.2%) had decreased platelet count. More than half of the cases admitted with fever have thrombocytopenia. (Table 1)

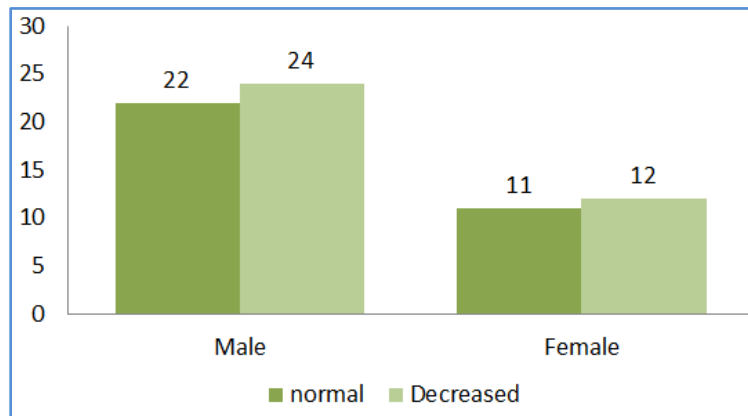| Platelet count	male	female
Normal	22 (47.8%)	11 (47.8%)
Decreased	24 (52.2%)	12 (52.2%))
Total	46 (66.7%)	23 (33.3%)
Table 2: Sex - wise distribution of cases		

Fig. 2: Sex - wise distribution of cases

In the present study 46 patients (66.7%) were males and 23 (33.3%) were females. Among males 24 (52.2%) had thrombocytopenia and among females 12 (52.2%) had thrombocytopenia. The study reveals that irrespective of sex and size of the sample the presentation of fever with/ without thrombocytopenia could not found any significant difference. (Table 2)

Disease	Normal platelet count	Decreased platelet count
Malaria PF + ve PV + ve mixed	5 (7.2%) 2 (2.9%) 3 (4.3%)	10 (14.4%) 3 (4.3%) 1 (1.4%)
Dengue	1 (1.4%)	5 (7.2%)
Cardiovascular system	3 (4.3%)	0
Respiratory system	11 (15.9)	3 (4.3%)
Gastrointestinal system	1 (1.4%)	3 (4.3%)

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Central nervous system	1 (1.4%)	1 (1.4%)
Urinary system	2 (2.9%)	2 (2.9%)
Undiagnosed	4 (5.8%)	8 (11.5%)
Total	**33 (47.8%)**	**36 (52.2%)**

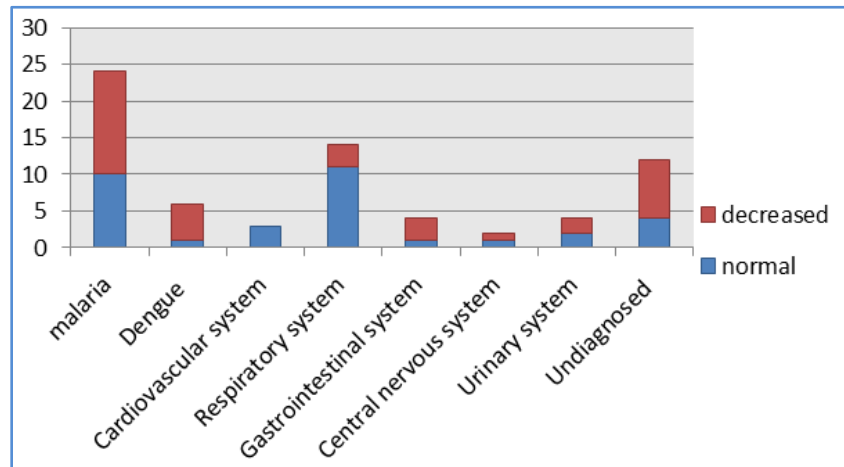Table 3: Distribution of diseases according to Platelet count

Fig. 3: Distribution of diseases according to Platelet

In the present study out of 69 cases of fever: Cases presented as fever with thrombocytopenia P. falciparum malaria contributed to 10 cases (14.4%) and P. vivax malaria contributed to 3 cases (4.3%) and 1 case was mixed malaria. dengue contributed to 5 cases (7.2%). 1 case of pneumonia, 1 case of Pulmonary tuberculosis, 1 case of pleural effusion had thrombocytopenia together contributed to 4.3 % of cases.

Comparison against normal platelet count cases: The present study reveals that thrombocytopenia was not found in cardiac cases (4.3%). Where as in the cases of respiratory system only three (4.3%) out of eleven cases have decreased platelets. However 50% of cases of nervous system (1.4%) and urinary tract infections (2.9%) have been found to have thrombocytopenia. In the present study it is found that out of 15 cases of falciparum malaria 10 cases had thrombocytopenia. Out of 12 undiagnosed cases 8 cases had thrombocytopenia. Out of 4 cases of gastro intestinal system 3 cases had thrombocytopenia.

In the present study it is significantly found that the highest difference is seen in the presentation of dengue cases. Out of total sample (69) cases it is found 5cases (7.2%) of thrombocytopenia with dengue fever are found against 1case (1.4%) of dengue fever with normal plate let count. (Table 3)

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| Disease	<50,000	50,000 – 1,00,000	>1,00,000 – 1,50,000
Malaria PF+ve PV+ve mixed	6 (16.6%) 0 1 (2.8%)	2 (5.6%) 1 (2.8%) 0	2 (5.6%) 2 (5.6%) 0
Dengue	3 (8.3%)	2 (5.6%)	0
Cardiovascular system	0	0	0
Respiratory system	0	0	3 (8.3%)
Gastrointestinal system	0	2 (5.6%)	1 (2.8%)
Central nervous system	0	0	1 (2.8%)
Urinary system	2 (5.6%)	0	0
Undiagnosed	2 (5.6%)	3 (8.3%)	3 (8.3%)
Total	**14 (38.8%)**	**10 (27.8%)**	**12 (33.4%)**
Table 4: Distribution of cases in relation to severity of thrombocytopenia			
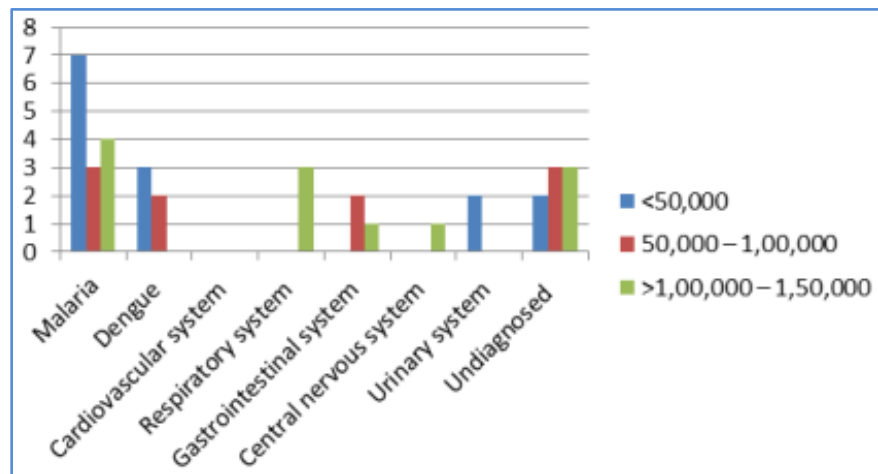
Fig. 4: Distribution of cases in relation to severity of thrombocytopenia count

The present study reveals that there is significance difference among various diseases such as malaria 14(16.6%), dengue fever 5 (13.9 %), Urinary tract infection 2 (5.6%), undiagnosed 8(22.2%). Whereas severe thrombocytopenia (platelets less than 50,000) seen in14 cases (38.8%) out of 36 cases of fever with thrombocytopenia. Further it reveals that in the cases of malaria 50% of cases reported as severe thrombocytopenia 7 cases (19.4%) followed by dengue fever3 cases (8.3%).

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Mild thrombocytopenia (platelet count 1, 50,000-1, 00,000) is present in cases of nervous system1 (2.8%) and respiratory system3 (8.3%) whereas mild to moderate (100,000—50,000) thrombocytopenia is found in gastro intestinal disorders 3 (8.3%).

Malaria is seen in 14 cases (38.8%) out of them severe thrombocytopenia is seen in 7 cases (19.4%) moderate3 (8.3%) mild 4(11.1%).

Dengue fever is seen in 5cases (13.9%) out of them 3cases have severe thrombocytopenia and 2 have moderate thrombocytopenia.

Undiagnosed cases are 8(22.2%) out of them 2 severe, 3 moderate and 3 mild thrombocytopenia. Urinary tract infection is seen in 2cases (5.6%) which have severe thrombocytopenia.

Severe thrombocytopenia is seen in 25% (2 out of 8)of undiagnosed cases, 50%(7 out of 14) cases of malaria, 60% (3 out of 5)cases of dengue fever,100%(2 out of 2)cases of urinary tract infection of the fever cases presented with thrombocytopenia. (Table 4)

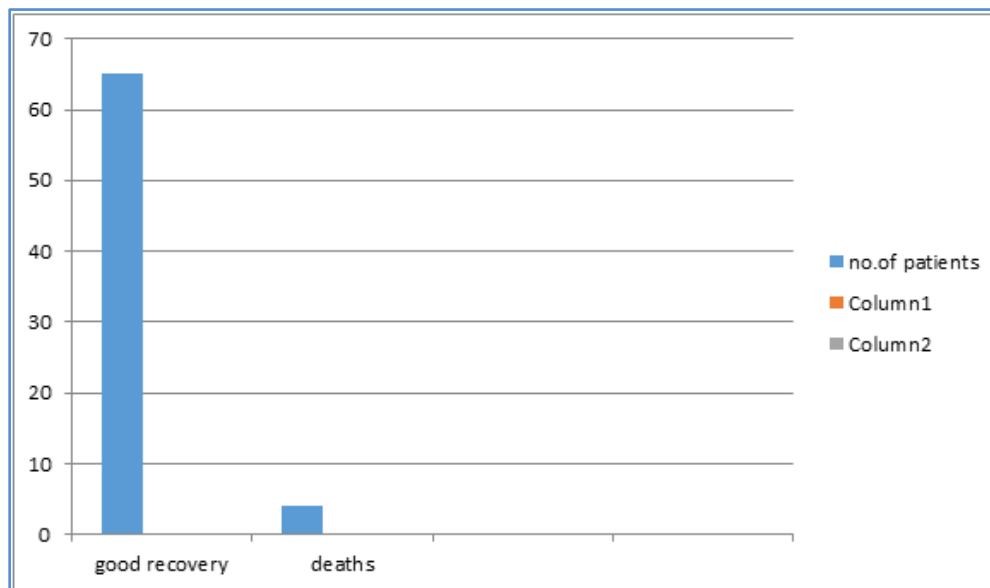| Recovery	No. of patients	Percentage
Good recovery	65	94.2%
Deaths	4	5.8%
Table 5: Recovery of patients		

Fig. 5: Recovery of patients

In this study 4 cases out of 69 have mortality due to sepsis (3) cases, immunosuppressed state with TB meningitis (1) case (Table 5).

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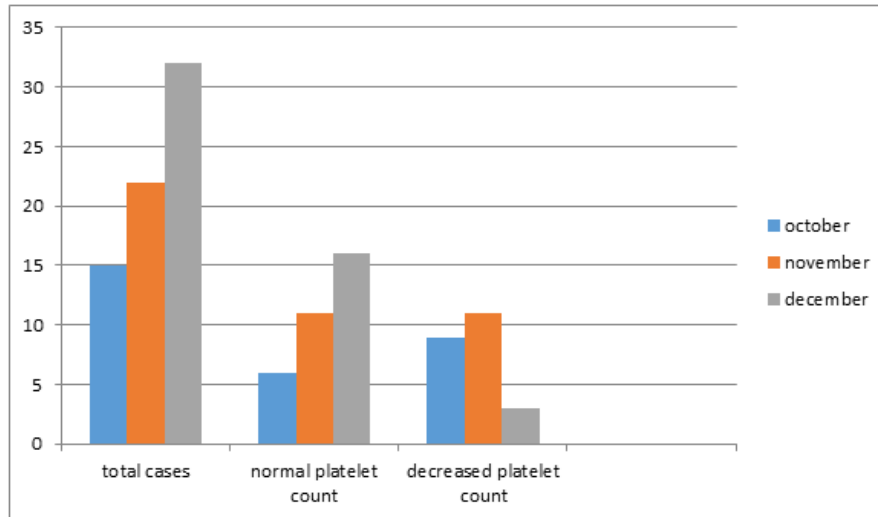| Patients	October	November	December
Total cases	15 (21.7%)	22 (31.9%)	32 (46.4%)
Normal platelet count	6 (8.7%)	11 (15.9%)	16 (23.2%)
Decreased platelet count	9 (13%)	11 (15.9%)	16 (23.2%)
Table 6: Seasonal variation of cases observed in this study			

Fig. 6: Seasonal variation of cases observed in this study

This study reveals incidence of fever cases and fever with thrombocytopenia are more during early winter. (Table 6).

DISCUSSION: Fever is a common manifestation of illness that it is not surprising to find accurate description of febrile patients in early recognized history[5]. It is in the diagnosis of febrile illness that the science and art in medicine come together. It is very important for platelet count estimation in diagnosing and managing fevers.

In this study fever with thrombocytopenia accounts more than half of the fevers indicating the significance of platelets. No history of bleeding manifestations masks the need of this investigation but occult form of thrombocytopenia is still present which highlights the importance of platelet estimation in various febrile disorders. Even though there is significant difference in sample size in respect of gender the study reveals that febrile thrombocytopenia can affect male and female equally. It mainly depends up on the pathology of the disease. Thrombocytopenia is common in malaria especially in falciparum type and is due to sequestration, immune mediated destruction with elevated platelet activated immunoglobulin.[6] Followed by dengue fever due to immune mediated mechanism.[7] Two cases of urinary tract infection have severe thrombocytopenia (less than 50,000) showing that the role of estimation of platelets in uncommon infections. Simple lower respiratory tract infections have also thrombocytopenia indicating immune mediated pathology of febrile

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thrombocytopenia. Deaths may be due to undiagnosed infection with septicemia which causes sequestration of platelets and rapid loss. Four cases have mortality as they are undiagnosed (may be due to early induction of empirical treatment and limitation of diagnostic modalities). Out of the four cases three cases have thrombocytopenia and multi organ dysfunction. Fevers with thrombocytopenia shown seasonal variations indicate the changing pattern of fever presentation especially due to viral mutations.[8]

SUMMARY:

1. Fever cases are very difficult to manage unless the laboratory support.
2. Not only malaria, dengue fever, and urinary tract infection can also causes severe thrombocytopenia.
3. Fever with thrombocytopenia is the common manifestation of infective diseases.
4. Fever cases especially with thrombocytopenia shows seasonal variations. They are seen commonly in early winter.
5. Total platelet count varied accordingly to the etiology of the fever. Malaria causes have severe thrombocytopenia followed dengue fever.
6. Mortality depends on the associated other system dysfunction along with thrombocytopenia especially with MODS.
7. Platelet count should be ordered routinely and immediately in every case of fever irrespective of the underlying etiology.
8. Febrile thrombocytopenia still presents as atypical and occult forms making diagnosis difficult.

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