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Exploring the Relationship between Mott Cells, Platelet Counts, and Disease Severity:A Preliminary Investigation

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Abstract

Aims and Objectives: To correlate the mott cell count and platelet indices and mott cells with the severity of the clinicaloutcomes such as bleeding, haemorrhageand shock syndrome in a Dengue population.

Materials and Methods: A sample population of 30 serologically positive dengue patients were taken for the study andstudied for 1 month. Blood samples from serologically positive dengue patients were collected and analysed using Mindray bc 6200 hematology analyser for complete blood picture including platelet indices like mean platelet volume (MPV), platelet distribution width(PDW) and Platecrit(PCT). The sample was also used to see the morphology of mott cells under peripheral smear. Data was collected and analysed using Microsoft Excel, Chi-square test and correlation statistics.

Results: In this study, out of 30 serologically positive dengue patients, only two of them had high mott cell count. In thosepatients, platelet count was also decreased. Mott cells with PDW showed negative correlation but were not statistically significant.

Conclusion: There is a correlation between mott cells and platelet counts being high mott cell count correlates with lowplatelet counts in some of the patients but it is considered insignificant due to limited sample size. Low platelet counts were also associated with high PDW and low PCT in all the patients in the study indicating a relation among the three parameters. There is also a relation between platelet indices and the severity of the disease but no significant relation was foundbetween mott cells and severity of the disease.

Keywords: Mott cells

Introduction

Dengue is an acute viral illness caused by the RNA virus of the family Flaviviridae and spread by Aedes mosquitoes[1]. It is one of the most devastating mosquito- borne viral diseases in humans and is now a significant problem in several tropical countries. It is re-emerging throughout the tropical world, causing frequent recurrent epidemics. Early and accurate diagnosis is critical to reduce mortality. Although dengue virus infections are usually self-limiting, dengue infection has come up as a public health challenge in tropical and subtropical nations. Presenting features may range from asymptomatic fever to dreaded complications such as hemorrhagic fever and shock. Acute-onset high fever, muscle and

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joint pain, myalgia, Petechiae, cutaneous rash, hemorrhagic episodes, and circulatory shock are the commonly seen symptoms[1]. One of the defining features of severe disease is increased capillary permeability causing plasma leakage, which can lead to intravascular volume depletion and, if left untreated, shock and death. The underlying mechanisms for progressing to severe disease have not been fully elucidated, but due to the strong association of severe dengue and secondary infection with a different serotype, an immune-mediated pathogenesis has been postulated[2]. The disease, caused by the four dengue virus serotypes, ranges from asymptomatic infection to undifferentiated fever, dengue fever (DF), and severe dengue hemorrhagic fever (DHF) with or without shock. Four dengue viruses (DENVs) are transmitted by urban cycle mosquitoes causing diseases whose nature and severity are influenced by interacting factors such as virus, age, immune status of the host, and human genetic variability[3]. DHF is characterized by fever, bleeding diathesis and a tendency to develop a potentially fatal shock syndrome.Mott cells are plasma cells that have spherical inclusions packed in their cytoplasm. The term 'Mott cell' is named after a surgeon, F. W. Mott, who identified these cells in the brains of monkeys with trypanosomiasis (1901). He termed it morular cell (from the Latin morus, mulberry) and recognized these cells to be plasma cells and therefore indicative of chronic inflammation[4].

Platelet indices (PIs)- Platecrit, mean platelet volume (MPV) and platelet distribution width (PDW)-are a group of platelet parameters obtained as a part of complete blood count using automated hematology analyzers. Evidence suggests that PIs may have diagnostic and prognostic value in febrile thrombocytopenia. Platelet indices are useful parameters in dengue infection. Other than platelet count, PDW, MPV, plateletcrit are useful to monitor dengue fever [8]. In the past decades, profound contributions have been made towards understanding its epidemiology, including disease burden and distributions, risk factors, and control and prevention practices. Vector control progress has driven new breakthroughs in biotechnology, including Wolbachia-infected Aedes and genetically modified Aedes. Both Aedes variants have been used to block transmission of the dengue virus through population replacement and suppression. In the future, vector control should still be pursued as a key measure to prevent transmission, along with anti-viral drug and vaccine research[5].

Rationale of the study: As Dengue is the fastest spreading mosquito- borne viral infectious disease worldwide with remarkable morbidity and mortality, it is important for us to know severity of the disease in order to control the disease. This research project enables us to know whether there is any correlation between the mott cell count and platelet indices,so that we could get to know the severity of the disease.

(The study is carried out in a private medical hospital,which has a strong public health infrastructure, which means it includes a capable and qualified workforce, up-to-date data and information systems, and agencies that can assess and respond to public health needs.

The sample size taken is 30 and the data is collected from dengue positive patients. The proposed outcome of the study is that high mott cell count correlates with low platelet count and thereby induces relatively worse clinical outcomes such as high fever, myalgia, petechiae, bleeding, hemorrhage and shock syndrome).

Methods

Study Design

We performed a quantitative, analytical study between the mott cell count and platelet indices along with the severity of the clinical outcomes

Setting

This study was conducted at Dr. Pinnamaneni Siddartha Institute of Medical Sciences and Research foundation, Vijayawada between the period of September to October 2021.A total of 30 dengue serology positive both males and female were included in this study. Data was collected from serological examination, peripheral smear examination.

Participants

Inclusion criteria:

Patients with serologically positive for dengue either NS1, IgM, IgG or ELISA along with clinical features such as fever, myalgia, petechiae were included. Presence of fever was defined as a body temperature of more than 37.5 C or complaint of fever or intake of antipyretics.

(1) Patients with negative serology for dengue infection

(2) Patients diagnosed with bacterial, parasitic, or any viral infection other than dengue will be excluded.

Variables

The proposed outcome of the study is that high mott cell count correlates with low platelet count and there by induces relative worse clinical outcomes such as high fever, myalgia,petechiae, bleeding, haemorrhage and shock syndrome. There were no potential confounders and effect modifiers. The variables will be compared based on gender,age, severity of disease.

Datasources/Measurement

Blood sample from patients with positive dengue serology were collected and analysed using Mindray bc 6200 hematology analyser. This automatic analyser quantifies the parameters of blood morphology and leukocyte differential in

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five population (5-Diff). It provides complete blood picture. Blood sample was used to make a peripheral smear to see the morphology ofthe mott cells or plasma cells. The study was approved by the Institutional Ethics Committee of Dr.Pinnamaneni Siddartha Institute of Medical Sciences and Research Foundation.

Bias

No bias noted

Quantitative Variables

In the study patients were grouped based on age, gender, severity of symptoms. (1)Age:Study participants were grouped in to 3 categories ; Below 30 years, 30–60 years, above 60 years (2) Gender:Male and Female (3) Temperature: study participants were grouped in 3 categories ; with a temperature of1000F, 1000-1020F, more than1020F. (4) Platelet count:Normal range of platelet count is 1,50,000-4,00,000/uL. A count of below 1,50,000/uLis considered to be decreased (Thrombocytopenia) which is the main feature of Dengue fever.

Statistical Methods

All the collected data was entered into Microsoft Excel and then thoroughly checked for any missing data.SPSS trail version 25 was used. Data was expressed in percentages. frequencies, tables, mean, and standard deviation. Percentages were represented using pie charts and bar graphs. The Chi-square test was used for analysis. Correlation statistics was used. A p-value less than 0.05 was considered statistically significant.

Table 1: Frequencies and percentages of temperature, myalgia, petechiae and blood transfusions.

Temp	N	%
100°F	6	20
100-102°F	18	60
>102°	6	20
Myalgia	N	%
Mild	12	40
Moderate	12	40
Severe	6	20
Petechiae	N	%
Mild	14	47
Moderte	10	20
Severe	6	33
Tansfusions	N	%
Yes	27	90
No	3	10

Table 2: Blood parameters and their mean and standard deviations

Blood parameters	Mean	SD
Hb	13.16	1.83
TLC	7.13	4.34
AMC	5.33	3.63
Mott cells	1.06	1.36
ALC act	8.26	7.34
ALC non act	18.47	7.66
Platelet count	145.7	61.48
MPV	9.71	1.37
PDW	16.68	0.91
PCT	0.11	0.07

Table 3: Frequency and percentage of platelet counts

Platelet count	n	%
Decreased	14	46
Normal	16	54
Total	30	100

Table 4: Correlation statistics between mott cells and platelet indices (MPV, PDW, PCT).

		Mott cells	MPV	PDW	PCT
	Pearson Correlation	1	-0.002	0.12	-0.082
Mott cells	Sig. (2-tailed)		0.99	0.527	0.667
	N	30	30	30	30
	Pearson Correlation	-0.002	1	** .691	** -0.52
MPV	Sig. (2-tailed)	0.99		0	0.003
	N	30	30	30	30
	Pearson Correlation	0.12	** .691	1	** -.692
PDW	Sig. (2-tailed)	0.527	0		0
	N	30	30	30	30
	Pearson Correlation	-0.082	** -.520	** -.692	1
PCT	Sig. (2-tailed)	0.667	0.003	0	
	N	30	30	30	30

**. Correlation is significant at the 0.01 level (2-tailed).

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Table 5: Correlation statistics among mott cells and temp

					Temp		Total
			100		>102°F	100° to 102°F	
			°F				
	Count		3		2	10	15
	.00		20.				
	% within Mott cells		0%		13.3%	66.7%	100.0%
	Count		2		2	1	5
	1.00		40.				
	% within Mott cells		0%		40.0%	20.0%	100.0%
	Count		1		1	4	6
	2.00		16.				
	% within Mott cells		7%		16.7%	66.7%	100.0%
Mott cells	Count		0		0	2	2
	3.00		0.0				
	% within Mott cells		%		0.0%	100.0%	100.0%
	Count		0		0	1	1
	4.00		0.0				
	% within Mott cells		%		0.0%	100.0%	100.0%
	Count		0		1	0	1
	5.00		0.0				
	% within Mott cells		%		100.0%	0.0%	100.0%
	Count		6		6	18	30
Total			20.				
	% within Mott cells		0%		20.0%	60.0%	100.0%
				42			

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Table 6: Correlation between Mott cells and myalgia

		Myalgia		Total
	mild	moderate	severe	
Count	7	5	3	15
0	46.7			
% within Mott cells	%	33.30%	20.00%	100.00%
Count	3	0	2	5
1	60			
% within Mott cells	%	0.00%	40.00%	100.00%
Count	1	5	0	6
2	16.7			
% within Mott cells	%	83.30%	0.00%	100.00%
Count	1	1	0	2
3	50			
% within Mott cells	%	50.00%	0.00%	100.00%
Mott cells				
Count	0	1	0	1
			0.00%	
4				
% within Mott cells	0.00%	100.00%		100.00%
Count	0	0	1	1
5				
% within Mott cells	0.00%	0.00%	100.00%	100.00%
Count	12	12	6	30
Total	40			
% within Mott cells	%	40.00%	20.00%	100.00%

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Table 7: Correlation between mott cells and petechia

					Mott cells				Total
			0	1	2	3	4	5	
		Count	8	2	3	0	1	0	14
		% within Petechiae	57.1%	14.3%	21.4%	0.0%	7.1%	0.0%	100.0 %
	mild	% within Mott cells	53.3%	40.0%	50.0%	0.0%	100.0 %	0.0%	46.7%
		Count	4	2	2	2	0	0	10
Petechi ae	moderat e	% within Petechiae	40.0%	20.0%	20.0%	20.0%	0.0%	0.0%	100.0 %
		% within Mott cells	26.7%	40.0%	33.3%	100.0 %	0.0%	0.0%	33.3%
		Count	3	1	1	0	0	1	6
	severe	% within Petechiae	50.0%	16.7%	16.7%	0.0%	0.0%	16.7%	100.0 %
		% within Mott cells	20.0%	20.0%	16.7%	0.0%	0.0%	100.0 %	20.0%
		Count	15	5	6	2	1	1	30
Total		% within Petechiae	50.0%	16.7%	20.0%	6.7%	3.3%	3.3%	100.0 %
		% within Mott cells	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %

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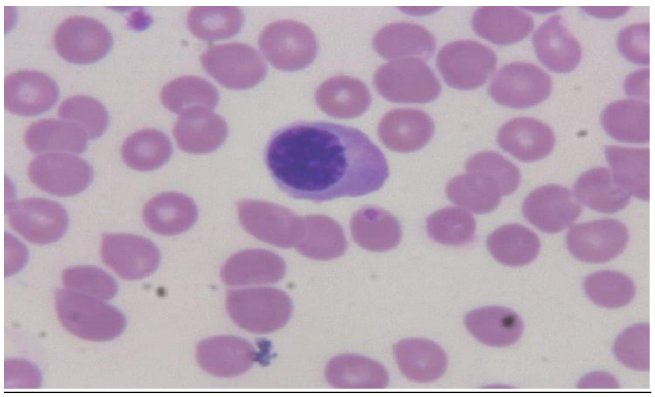
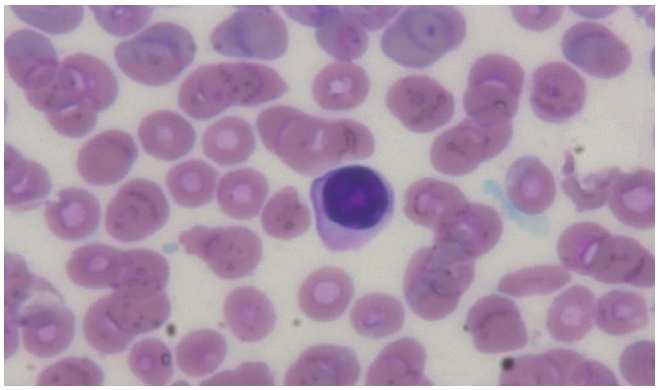
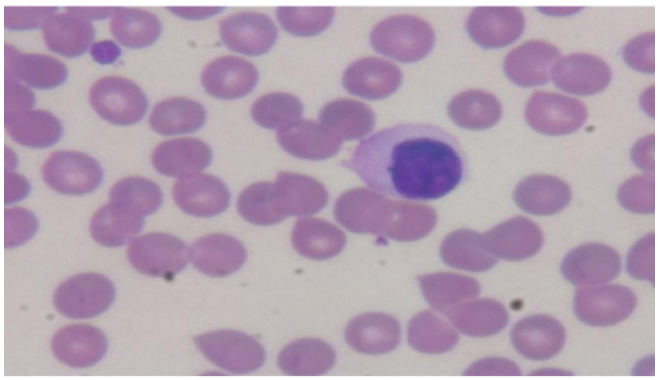
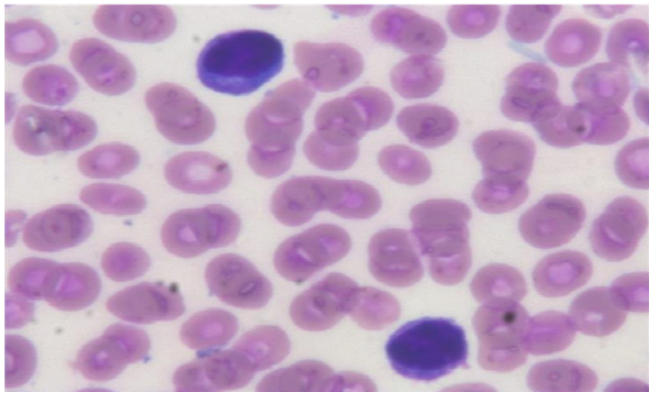
Peripheral smears:









Case study form

Demographic data:

Age:

Gender:

Clinical Features:

Investigations:

Hemoglobin (Hb):

Total leucocyte count (TLC):

Absolute monocyte count(AMC):

Mott cells:

Absolute lymphocyte count(ALC):

Platelet count:

Mean platelet volume (MPV):

Platelet distribution width (PDW):

Plateletcrit(PCT):

Parameter	Normal range
Hb	13-17 gm %
TLC	4.0-11.0 X 10^3 cells/ µ L
AMC	1-7 %
ALC	20-40 %
PLATELET COUNT	150-400 X 10^3 cells/ µ L
MPV	6.5-12.0 fL
PDW	15-17
PCT	0.108-0.282

Results

Participants

A total of 30 patients with serologically positive dengue (either NS1, IgM, or ELISA positive) with clinical features suggesting dengue were taken. Patients who were negative for serology for dengue infection or diagnosed with bacterial, parasitic, or any viral infection other than dengue infection were not included in the study.

Descriptive Data

All the patients were reported at Dr. Pinnamaneni Siddartha Institute of Medical Sciences and Research

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foundation, Vijayawada between the period of September to October 2021 and were infected by Dengue virus belonging to different socioeconomic class, with different severity of illness. The distribution of study participants according to category were as follows. (1) AGE: Among 30 patients, 9 (30%) lies below 30 years of age, 16(53%) lies between 30 &60 years, 5(17%) lies above 60 years of age. (2) GENDER: among 30 dengue patients,11(37%) of them were females, 19(63%) of them were males. The clinical features included were Fever,Myalgia, Petechiae. Among 30 dengue patients, 6(20%) of them have temperature above 1000F, 18(60%) ofthem have 1000-1020 F and 6(20%) of them have the temperature above 1020F. (3) MYALGIA: Among 30 patients 12(40%) of them have mild ,12(60%) ofthem have moderate, and 6(20%) of them have severe myalgia. (4) PETECHIAE: Among 30 dengue patients, 47% of them have mild petechiae, 33% of them have moderate petechiae, 20% of them have severe petechiae.(5)SEROLOGY: Among 30 dengue patients,93% ofthem were NS1 positive and 7% were NS1 negative.7% of them were IgM positive and 28% of them were IgM negative.

Outcomes Data

The outcome of this study includes correlation statistics between mott cells and platelets indices (MPV, PDW, PCT). Examination of blood parameters the Mean +/- Standarddeviation of MPV was 9.71 +/- 1.37, PDW was16.68 +/- 0.91 and PCT was 0.11 +/- 0.07. The correlation statistics between mott cells and platelet indices were given in Table4. Correlation statistics between mott cells and temperature is given in Table 5. Correlation statisticsbetween mott cells and myalgia is given in Table 6. Correlation statistics between mott cells and petechiae under Table 7.

Main Results

In this study there is a correlation between mott cells and platelet count in some of thepatients (0.01 level 2-tailed) but is considered insignificant due to limited sample size. Mott cells with PDW showed negative correlation but was not statistically significant due to less sample size. By this study we can know that there is a relation between platelet indices and the severity of disease as when there is low platelet count, PDW is high and PCT is low.From this study we can say that platelet indices can be used as probable indicators for knowing the severity of the disease. The is no significant relation between mott cells and severity of the disease. There is a correlation between mott cells and platelet indices but isconsidered insignificant due to less sample size.

Other Analyses

Subgroup Analysis between mott cells and temperature: In the group of 18 patients, with abody temperature of 100-102F,10 patients show 0.00% within mott cells, 4 patients show 2.00% within mott cells, 2 patients show a 3.00% within mott cells ,1 patient show 4.00% within mottcells and 0 patients show a 5.00%within mott Dengue fever is the one of the most important arboviral infection. It has become a major global public health problem in India. Epidemics are becoming more frequent now days. meticulous management are very important to save precious lives from this killer disease.[16] This particular study was aimed to correlate the mott cells with platelet indices and mott cells with the clinical outcomes (fever, myalgia and petechiae) among 30 serologically positive dengue patients. In this study during the peripheral examination plasmacytosis was observed only during 1st week of the disease and also it was not observed in all the patients but in the study done by K. T. D. Thai et., White blood count (WBC) subsets, stratified by days after onset of symptoms. Overall, blood plasmacytosis was demonstrated in 16/28 (57%) returned travelers with confirmed DENV infection. The frequency of plasmacytosis was 73% (11/15) among patients from whom blood was collected during the first 7 days of illness. Among patients from whom a blood sample was collected during the first 14 days of illness (DOI), plasmacytosis occurred in 64% (16/25). Plasmacytosis was not observed in any of the seven patients with OFI.

This is the first prospective study demonstrating that blood plasmacytosis, characterized by a transient increased amount of polyclonal PCs in the circulation, is a common hematological event in DENV infection. The plasmacytosis was most pronounced during the first week of disease and disappeared completely within 2 weeks [13]. In this study, in the peripheral smear only one or two plasmacytoid lymphocytes were revealed, whereas in the study done by Aniya Antony et al., Peripheral smear revealed numerous plasmacytoid lymphocytes and occasional cells with eccentrically placed nuclei packed with multiple prominent cytoplasmic vacuoles, morphologically consistent with Mott cells. Nonmalignant reactive peripheral blood plasmacytosis can occur in tumors, autoimmune conditions, and infections. Polyclonal peripheral blood plasmacytosis also occurs in Dengue virus infections and is prominent during the first week of the disease . However, the transient occurrence of Mott cells in the peripheral blood of Dengue feverpatients has not been reported previously.[7] In this study, out of 30 serologically positive dengue patients only 2 of them have high mott cell count , in those patients the platelet count is decreased. Other studies didn't find consistent correlation between mott cells and platelet count that might be partly due to different pathogenesis. In this study, among the 30 serologically positive dengue patients 28(93%) of them were NS1 antigen positive and remaining 2(7%) were IgM positive. NS1 (non- structural protein 1) is a highly conserved glycoprotein that is essential for the viability of DV and is produced both in membrane-associated and secretory forms by the virus.Enzyme-linked immunosorbent assays (ELISA)

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directed against NS1 antigen (NS1 Ag) have demonstrated its presence at high concentrations in the sera of DV infected patients during the early clinical phase of the disease.The detection of secretory NS1 protein represents a new approach to the diagnosis of acute DV infection. According to the study done by S Datta et al., Of the total 140 NS1Ag positive samples, 71.42% (100) were from acute phase serum samples and 28.4% (40) were from early convalescent phase. The NS1 Ag detection rate decreased from 71.42% in acute phase sera to 28.4% in early convalescent sera. All the 85 samples that were positive for NS1 Ag alone in this study group I belonged to acute phase sera. Conversely, of the 235 IgM positive samples, 93.61% (220) were from early convalescent phase and only 6.38% (15) were positive from acute phase sera. All the 180 samples that were only IgM positive belonged to early convalescent phase. The seroposivity of IgM increased from 6.38% in acute phase sera to 93.61% in convalescent sera [14]. So by this we can say that NS1 antigen positivity represents that the sera is collected in acute phase and IgM positivity represents that the sera in collected in acute convalescent phase. In this study, clinical features taken into consideration are fever, myalgia, petechiae and they were graded as following:

Fever:- 100°F, 100-102°F and >102°F

Myalgia:- mild, moderate and severe

Petechiae:- mild, moderate and severe

Here in petechiae mild represents only on one part of the body like hands or legs alone, moderate represents it has spread the upper trunk and severe represents that it has spread the whole body which should be considered seriously. In this study the platelet count is decreased in 46%(14) and it is normal in 54%(16) among. The 30 dengue patients. Development of thrombocytopenia in dengue patients mainly rests on two events: decreased production of platelets in the bone marrow and/or increased destruction and clearance of platelets from peripheral blood. In this study MPV is normal to all the 30 serologically dengue positive patients, according to the study done by Payal Mukker et al., Serially observing the MPV and platelets may guide a clinician in an important subset of patients in DF and severe dengue where the mechanism of thrombocytopenia is largely marrow suppression-initial MPV significantly low and the thrombocytopenia recovery following the MPV. Increased MPV indicates increased platelet diameter, which can be used as a marker of production rate and platelet activation. During activation, platelet's shapes change from biconcave discs to spherical, and a pronounced pseudopod formation occurs that leads to MPV increase during platelet activation. Platelets with increased number and size of pseudopodia differ in size, possibly affecting platelet distribution width (PDW) which increases during platelet activation.[8]

In this study there is a relation between platelet count, PDW and PCT. When the platelet count is low then PDW is high and the PCT is low among the 30 serologically positive dengue patients, where as in the study done by Payal Mukker et al., Low platelet count, low PCT and high PDW may be used as predictor of severity of Dengue infection. Shah et al a Borkataky et al, found a higher PDW in hyperdestructive thrombocytopenia when compared to hypoproductive thrombocytopenia [8]. Navya et al, studied the relationship between platelet parameters like platelet count, MPV and PDW and severity of the disease (DF/DHF/DSS). Significant difference was observed between severity of the thrombocytopenia and severity of the disease. Dengue positive cases were associated with low MPV and high PDW values in 72% cases and 92% cases respectively. They found Low MPV (13fl) shows sensitivity for dengue fever thus reflecting a predictive marker for diagnosing dengue fever in endemic area [20]. Sharma K et al, studied 200 Dengue fever cases. Out of which, 68% cases were of DF, 23% DHF and 9% DSS i.e. classical dengue fever was most common presentation.98% cases of dengue had thrombocytopenia. MPV showed no significant correlation with severity, serology and treatment outcome, thus excluding its role in dengue cases. No significant difference was observed in Mean between MPV at the time of minimal platelet counts and atdischarge in dengue cases except in dengue fever cases. [21] In this study correlation statistics was applied to mott cells , platelet indices and the clinical features. Correlation is considered to be significant at 0.01 level. In this study the relationship between mott cells and PDW was studied. Mott cells with PDW showed negative correlation but was not statistically significant. And with PCT also it showed correlation but not was not statistically significant. The reason might be selection of less of number of participants in the study.

In the present study the mean MPV is 9.71, mean PDW is 16.68 and mean PCT is 0.11, according to the study done by Lavanya Muddapu et al., The mean MPV was 7.29, mean PDW was14.51, mean PLT was 95x109 /l in test group. Low MPV which indicates bone marrow suppression was noted in 36.19% of patients with DF and 11.42% in patients with DHF. A high PDW which indicates as useful marker for platelet activation was seen in 59.19% of patients with DF and 11.42% in DHF patients. There is significant difference in platelet indices between test group and control group. Mean MPV and PLT was found to be significantly lower in test group compared to control group and mean PDW was found to be significantly higher in test group. P Values for MPV, PDW, PLT in test group is (0.0003, 0.001, 0.000) which shows that there is a significant difference in test group and control group platelet indices [15]. The hypothesis which is considered in this study is that High mott cell count correlate with low platelet count and thereby induces relatively worse clinical

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outcomes such as bleeding, hemorrhage and shock syndrome. In this study peripheral smears of the 30 serologically positive dengue patients were observed to see the morphology of the mott cell/plasma cell. In this study MPV was normal in most of the patients and so cannot be considered as specific criteria but according to the study done by Bashir AB et al., Platelets are involved in hemostasis, tissue repairing, and infection. To our knowledge, there are no studies investigating changes in platelet indices during dengue infection as a useful marker in our region. Among values in platelet indices during dengue infection, we believe that variations in the platelet indices are suitable for evaluation. MPV has been evaluated as a diagnostic tool in different conditions with thrombocytopenia with contradictory results. It has been demonstrated that MPV has sufficient sensitivity and specificity to discriminate aplastic anemia, bone marrow disease, hypoproductive thrombocytopenia, and bone marrow metastasis of solid tumor. However, it has been reported that although MPV may be used as an initial suggestion of bone marrow disease in thrombocytopenic patient, it has limited sensitivity and specificity.[17]

A study done by Jayanthi HK, Patient with lower platelet count was found to have higher chances of non-hemorrhagic complications including ARDS and encephalopathy. In this study, there was a statistically significant positive correlation between platelet count and complications. As the platelet counts decreased complications rate increased.[10] So one of the limitation of this study is platelet count can also be correlated to non-hematological complications, this also should have been done. Ibrahim et al. in his study showed that there was no correlation between initial platelet counts and age, use of intravenous fluids, or length of hospital stay. In our study, there was statistically significant negative correlation between platelet count and duration of hospital stay, as the platelet count decreased duration of hospital stay increased. [18] Prathyusha et al. in her study at eluru showed that with increasing severity of leukopenia there is increased the incidence of hemorrhagic manifestations including petechiae. However, she found no significant association of leukopenia with significant bleeding manifestations.In our study, there was no statistically significant correlation between .[19] leukopenia and complications rate in patients with dengue with thrombocytopenia The main implication of this study ,enables us to know whether there is any correlation between mott cell count and platelet indices, so that we could get to know the severity of the disease. Denguevirus (DV) has four distinct serotypes (DV1, DV2, DV3, and DV4). Infection with any of the four serotypes of DV causes a spectrum of clinical features ranging from asymptomatic infections, undifferentiated fever, and classical DF to life-threatening manifestations such as dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS). At present, however, there is no protective vaccine or specific treatment available for DV infections. Thus, early clinical management can reduce the morbidity and mortality of DHF or DSS. Since symptoms of dengue virus infections are insufficiently specific for accurate clinical differentiation from other febrile illnesses and hemorrhagic fever, definitive diagnosis of DV infections relies on laboratory tests. Mott cell count, obtained from peripheral smear, could with platelet counts and PIS and also clinical symptoms such as bleeding diathesis and shock. This correlative study could potentially give an insight to predict clinical outcome from individual patient, by calculating their mott cell count. There are a few limitations in this study that should acknowledge, firstly being a cross-sectional study long term clinical outcomes cannot be associated through prospective studies. The main limitations of this study is that larger number of patients are required to increase the accuracy of the findings. So that it would have been appropriate to know the accurate results. A much detailed studies Mott cells would've been better for drawing appropriate conclude

Conclusion and Summary:

- In this study there is correlation between mott cells and platelet counts in some of the patients but it is considered insignificant due to limited sample size. It is not possible to implicate correctly only on the basis of this correlation.
- So if the sample size is more then it would have been possible to know the correlation between the mott cells and platelet count.
- By this study we can know that there is a relation between platelet indices
- and the severity of the disease as when there is low platelet count, PDW ishigh and PCT is low.
- So therefore we can say that platelet indices can be used as probable indicators forknowingtheseverityofthedisease.
- There is no significant relation between mott cells and severity of thedisease.
- There is a correlation between mott cells and platelet indices but is considered insignificant due to less sample size.

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