Original Research Article

# COMPARISON OF MEAN PLATELET DISTRIBUTION WIDTH(PDW) IN RELATION TO THROMBOCYTOPENIA IN PATIENTS WITH DENGUE FEVER

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**A B S T R A C T**

**Background:** Dengue fever is a prevalent mosquito-borne viral illness with potential complications, including thrombocytopenia. **Objective:** This study aimed to investigate the relationship between platelet indices and the presence of thrombocytopenia in individuals diagnosed with dengue fever.
**Materials and Methods:** A total of 100 dengue-confirmed cases were enrolled, and their platelet count, platelet distribution width (PDW), and plateletcrit (PCT) were measured during the acute phase of the disease.
**Results:** The findings of this study revealed a substantial incidence of thrombocytopenia among the participants, aligning with the well-established association between dengue infection and platelet reduction. Notably, a modest but significant correlation was demonstrated between PDW and PCT and the severity of thrombocytopenia. Subgroup analysis based on dengue virus serotypes unveiled varying patterns of platelet indices, hinting at potential differences in disease pathogenesis.
**Conclusion:** The results of this study underscore the potential utility of platelet indices as informative markers for assessing the degree of thrombocytopenia in dengue fever cases. The observed correlations between platelet count, PDW, and PCT provide insights into the complex interplay between platelet dynamics and dengue infection. Further prospective investigations are warranted to elucidate the underlying mechanisms driving these correlations, which could contribute to enhanced understanding, diagnosis, and management of dengue-associated thrombocytopenia.
**Keywords**: Mean Platelet Volume (MPV), Platelet Distribution Width (PDW), Plateletcrit (PCT) and Platelet Large Cell Ration (P-LCR).

## INTRODUCTION

Dengue fever, caused by the dengue virus and transmitted primarily by Aedes mosquitoes, remains a significant global public health concern, particularly in tropical and subtropical regions.[1] Characterized by a spectrum of clinical manifestations ranging from asymptomatic infection to severe dengue, this viral illness affects millions of individuals annually. One of the hallmark complications associated with dengue fever is thrombocytopenia, a reduction in platelet count that can potentially lead to bleeding complications and other adverse outcomes.[2]

Platelets, the smallest blood cells, play a crucial role in hemostasis and wound healing.[3,4] In dengue fever, however, platelet destruction and dysfunction are commonly observed, contributing to the development of thrombocytopenia. As a result, investigating platelet-related parameters and their associations with thrombocytopenia in dengue-infected patients holds promise for elucidating the pathophysiological mechanisms underlying this complication.

In recent years, platelet indices such as mean platelet volume (MPV), platelet distribution width (PDW), and plateletcrit (PCT) have gained attention as potential indicators of platelet function and

health. MPV reflects the average size of circulating platelets, PDW indicates the variation in platelet size, and PCT represents the proportion of blood volume occupied by platelets.[5,6,7] These indices have been studied in various medical conditions to uncover potential insights into platelet dynamics and their roles in different disease processes.

This study aims to bridge the existing knowledge gap by investigating the relationship between platelet indices and thrombocytopenia in patients diagnosed with dengue fever. By analyzing the correlations between platelet count, PDW, and PCT in the context of thrombocytopenia severity, we seek to provide a better understanding of the intricate interplay between platelet physiology and dengue virus-induced thrombocytopenia. Furthermore, exploring potential variations in platelet indices based on different dengue virus serotypes could shed light on the role of viral factors in modulating platelet responses.

The outcomes of this study have the potential to contribute valuable insights to clinical practice. Understanding the associations between platelet indices and thrombocytopenia severity could aid in risk stratification, early detection of severe cases, and more effective management of dengue fever.[8] Moreover, unraveling the relationship between platelet dynamics and specific dengue virus serotypes could lead to tailored therapeutic strategies and enhance our overall comprehension of dengue pathogenesis.

## MATERIAL AND METHODS

**Source of data**
The present study was conducted in Department of Paediatrics, Gandhi Hospital, tertiary care hospital attached to Gandhi Medical College, Secunderabad. There has been an increasing incidence of Dengue fever in this part in the recent years. Bleeding manifestations are most common to occur in dengue fever. Dengue fever is known to involve multiple systems resulting in multi organ dysfunction. Hence our study was conducted to correlate the platelet parameters and severity of illness in Dengue illness.

**Collection of data**
**Study design:** A hospital based prospective observational study conducted in patients admitted Gandhi hospital, secunderabad

**Sample Size:** A total of 100 children less than 14 years fulfilling the inclusion criteria will be included in the study from January 2019 to April 2021 after taking written and informed consent.

**Duration of the study:** This study was conducted prospectively for a period from January 2019 to April 2021.

**Inclusion Criteria**
1. Children less than 14years of both genders will be considered for the study.
2. NS1 and/or IgM and/or IgG positive dengue cases established by immunochromatographic

strip tests [sensitivity 95.6%, specificity 96 %]. and serology.

**Exclusion Criteria**
1. Age more than 14yrs
2. Patients who are serologically negative for dengue infection.

**Investigations**
1. Complete Blood Picture with platelet indices [PDW, Platelatocrit]
2. Dengue Serology [NS1 Antigen and/or IgM and/or IgG antibodies]

**Methodology**
- The platelet parameters were measured by the Sysmex XN 1000 semi-automated hematology analyzer on venous samples collected in EDTA from 100 patients as a clinical sample.
- The specimens were analysed within 1 hour from venesection. Observations were considered valid only if the specimens were analysed within 1 hour from venesection, to avoid the problems occurring when EDTA collected samples are analysed.
- The parameters analysed included complete blood count, PLT, PDW, PCT.

## RESULTS

This is a prospective study conducted in Gandhi Medical College, Hyderabad, Telangana, India. The total number of confirmed dengue cases were 100. The study compares parameters on three days at the time of admission, on the day of least platelet count and the time of discharge. The study population included 100 subjects.
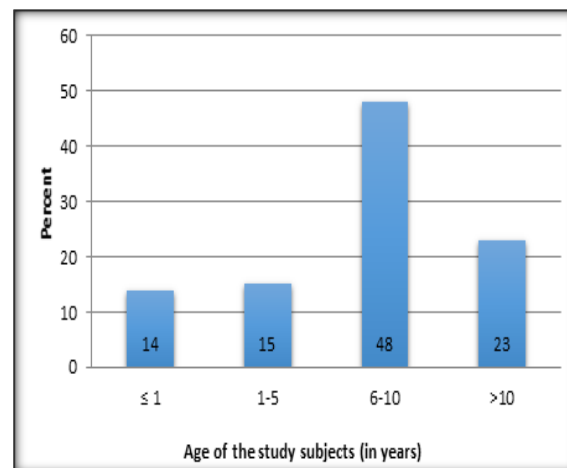


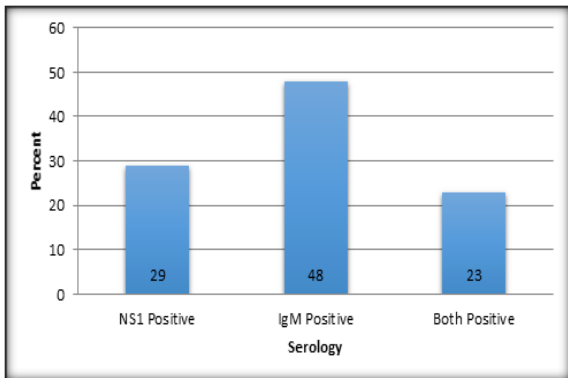**Graph 1: Distribution of Age Group**

The Mean age was 7.45 ± 3.7 years.
The young age in the group was 10months and eldest was 12 years. [Table 2]
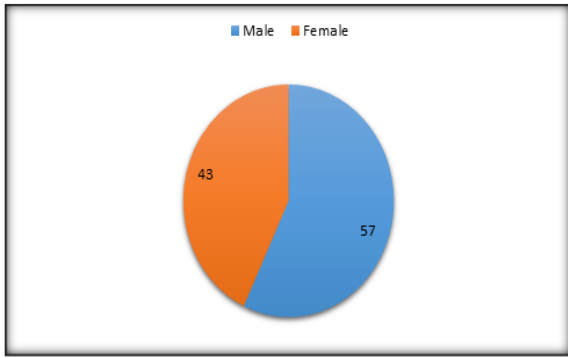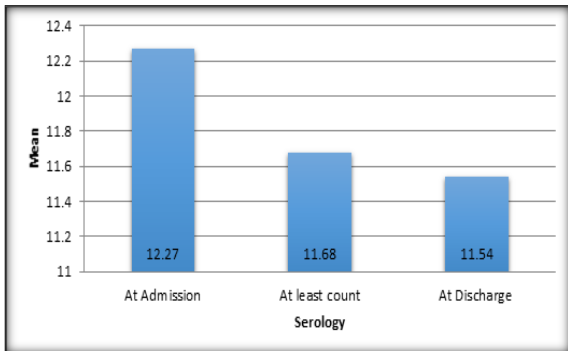
**Graph 2: Distribution of Gender**

Out of 100 cases 57 were male ,43 were female.
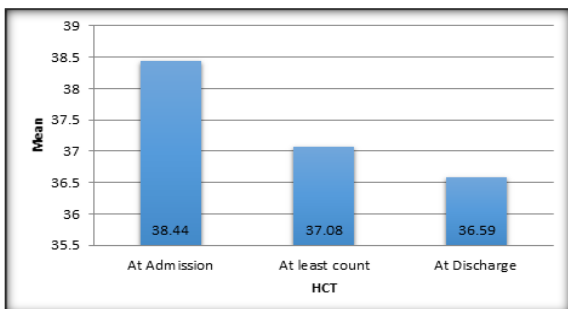M: F ratio is 1.32



**Graph 3: Distribution of Serology**

Out of 100 cases 29% were NS1 positive, 48% were IgM positive and 23% were both NS1 IgM positive.
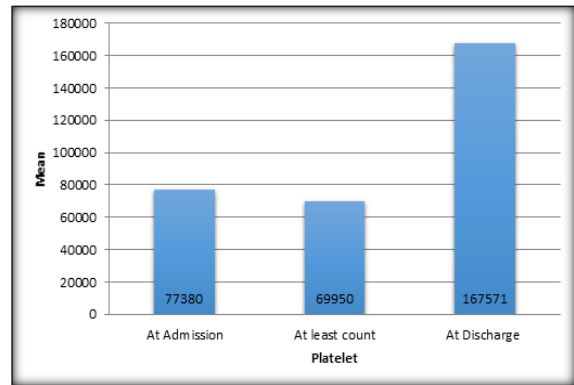


**Graph 4: Distribution of HB**

For all 100 cases the mean HB was 12.27 + 1.97 at admission, 11.68 + 2.08 on the day of least platelet count, 11.54 + 1.46 at discharge.
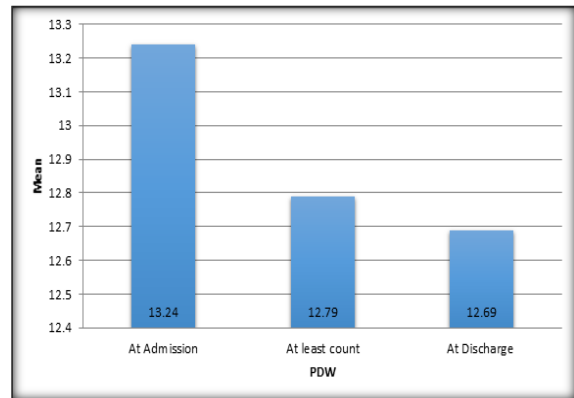


**Graph 5: Distribution of HCT**

Of subjects at admission HCT was 38.44± 5.60, on the day of least count was 37.08 ±5.84, at discharge 36.59± 4.51.



**Graph 6: Distribution of Platelet**

Platelets mean was 77380±63975 at the time of admission, on the day of least count was 69950± 61029, at discharge 167571 ±83393.
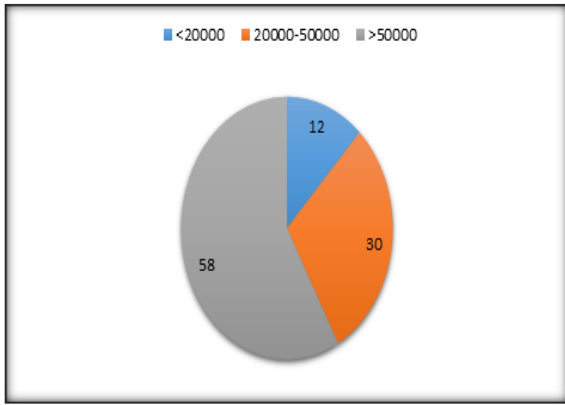


**Graph 7: Distribution of PDW**

PDW was 13.24± 0.91 at the time of admission, 12.79± 0.75 onthe day of least platelet count, 12.69± 0.72 at the time of discharge of all cases.
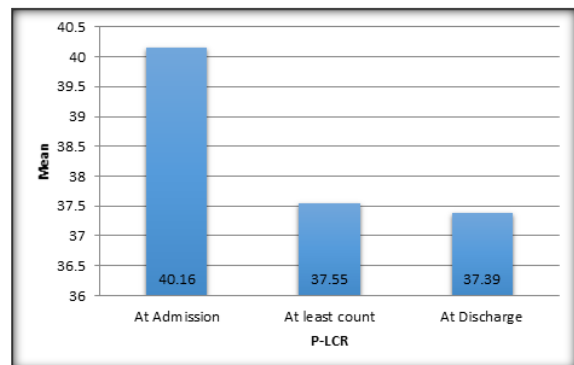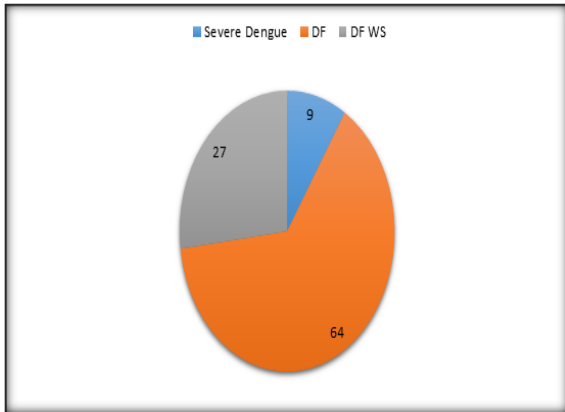


**Graph 8: Distribution of P-LCR**

PDW was 13.24± 0.91 at the time of admission, 12.79± 0.75 onthe day of least platelet count, 12.69± 0.72 at the time of discharge of all cases.

**Graph 9: Distribution of Platelet Lowest Count**

Of all dengues cases, on the day of lowest platelet count 58 subjects have mild thrombocytopenia (>50000 per microlitre) 30 subjects have moderate thrombocytopenia (20000-50000 per microlitre), 12 had severe thrombocytopenia (<20000 per microlitre) in range of counts with spontaneous bleeding.



**Graph 10: Distribution of Diagnosis**

Study subjects were divided into three groups; Dengue fever (64 subjects); Dengue fever with warning signs (27 subjects) like capillary leak, bleeding manifestations; and severe dengue (9 subjects) with multiorgan involvement like encephalitis, hepatitis, DIC, renal failure.

Of all dengue fever cases the mean hemoglobin was 12.27 ±1.76 at the time of admission,11.68± 1.47 on the day of least platelet count, 11.57 ± 1.37at discharge. Of all dengue fever with warning signs mean Hb was 12.38 ±1.4 on admission, 12.43 ± 2.11 on the day of least platelet count, 11.75 ±1.11 on discharge. Of 9 severe dengue cases the mean Hb was 11.96 ±3.83 on admission ,10.80 ± 2.56 at the time of discharge, 9.40 ± 3.78 on the day least platelet count (P Value 0.001 which is significant) suggesting blood loss occurs in severe dengue. [Table 11]
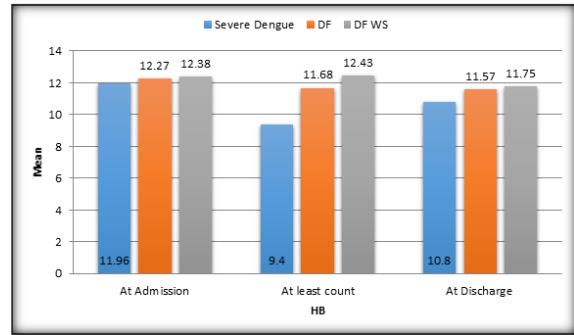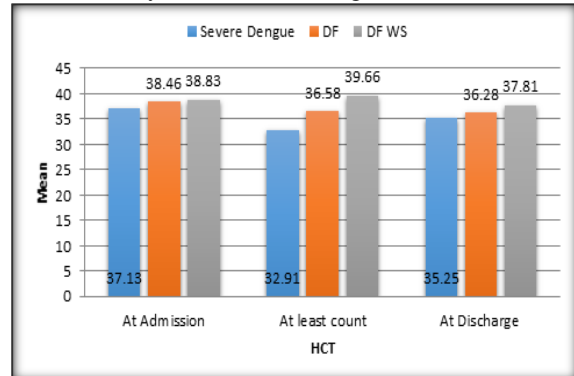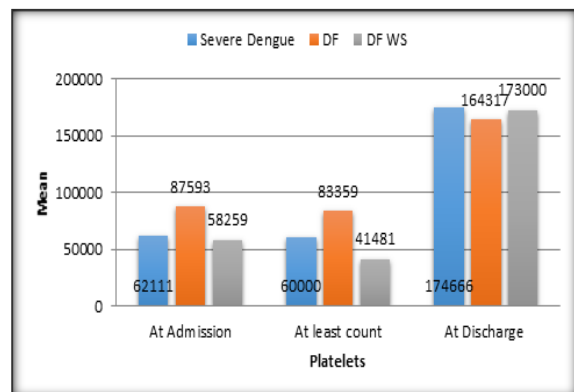


**Graph 11: Diagnosis and HB**
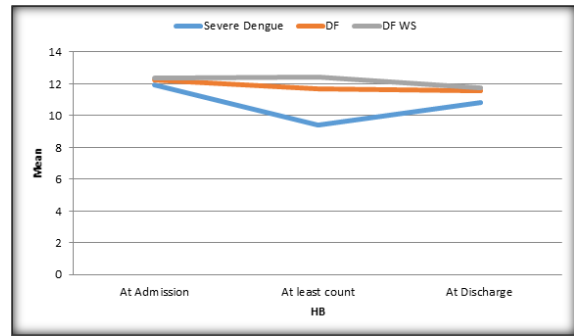


**Graph 11: Diagnosis and HB**

Of all subjects low hematocrit was significant (P Value – 0.005) in severe dengue cases on the day of least platelet count i.e 32.91 ± 11.24 , suggesting low HCT may be due to bleeding.



**Graph 12: Diagnosis and HCT**



**Graph 13: Diagnosis and Platelets**

**Graph 13: Diagnosis and Platelets**

Of all cases there is significant decrease in platelet count in severe dengue subjects (P Value 0.009).
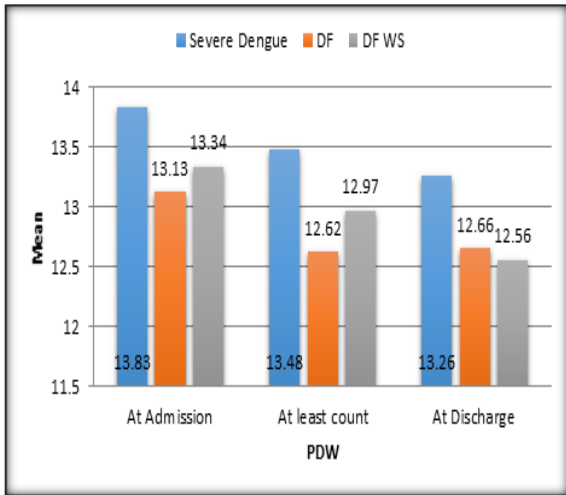


**Graph 14: Diagnosis and PDW**
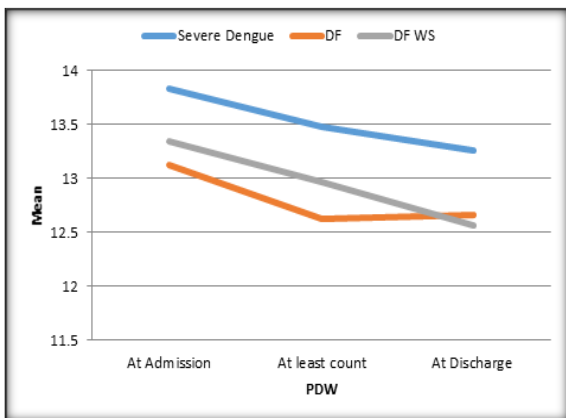


**Graph 14: Diagnosis and PDW**

On statistical analysis of Platelet Distribution Width (PDW) of all cases, there was significant association on the day of least platelet count and on the day of discharge in all cases irrespective of diagnosis.
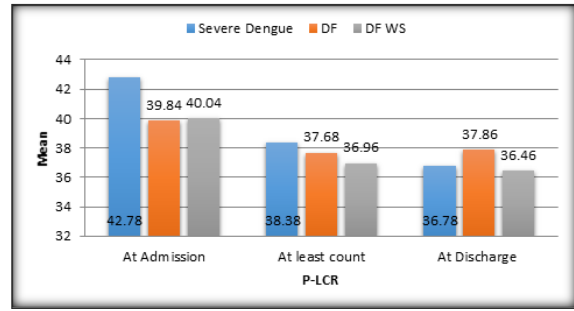


**Graph 15: Diagnosis and P-LCR**

On statisticial data and anylsis of platelet large cell ratio (P- LCR) there was significant association only on the day of discharge (P Value < 0.05).
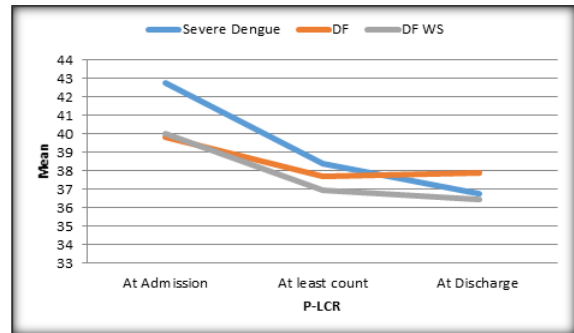


**Graph 15: Diagnosis and P-LCR**
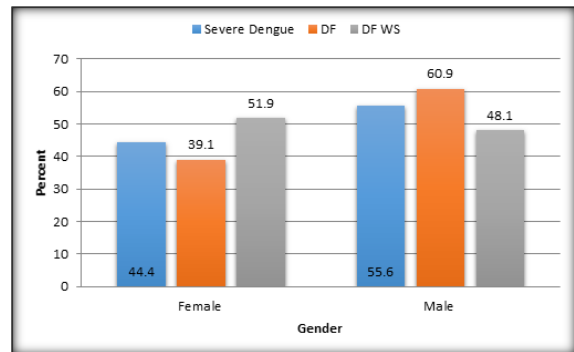


**Graph 16: Diagnosis and Gender**

There was no significant association between severity of dengue (diagnosis) and gender affecting both genders equally
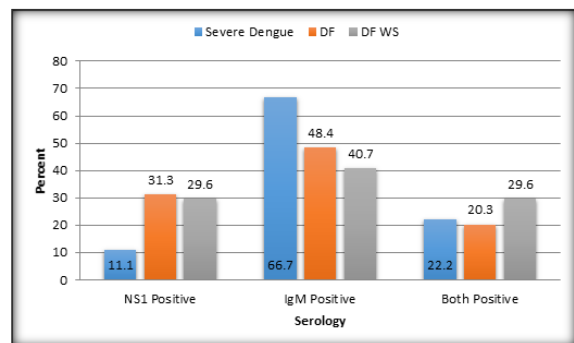


**Graph 17: Diagnosis and Serology**

There was no significant association (P Value – 0.595) between diagnosis and serology.
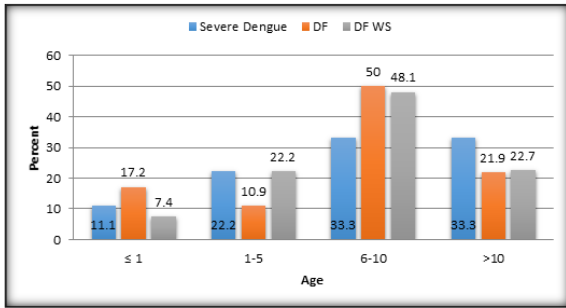
**Graph 18: Diagnosis and Age**

There was no significant association between diagnosis and age suggesting that dengue affecting all age groups less than 14 years equally.
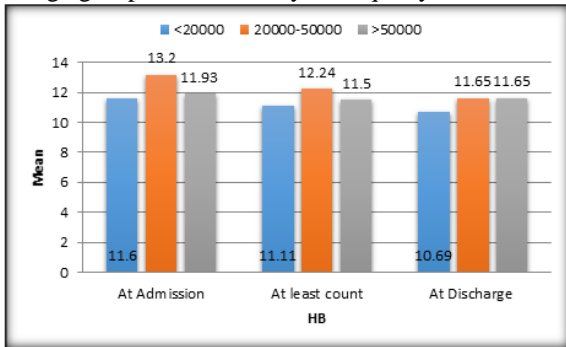

**Graph 19: Platelet and HB**
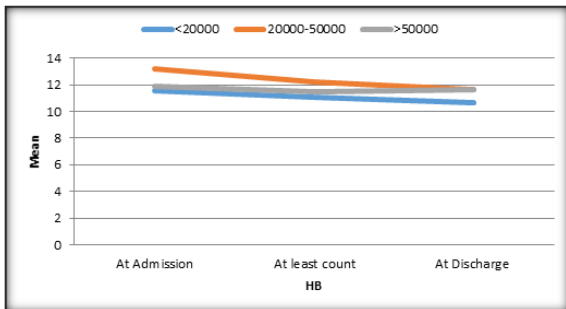

**Graph 19: Platelet and HB**

Of all cases there was significant association between platelet count and hemoglobin at admission (P Value – 0.007). and not significant on day of least platelet count and at discharge.
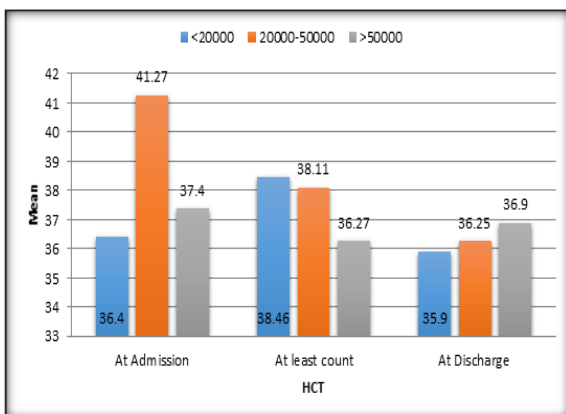

**Graph 20: Platelet and HCT**
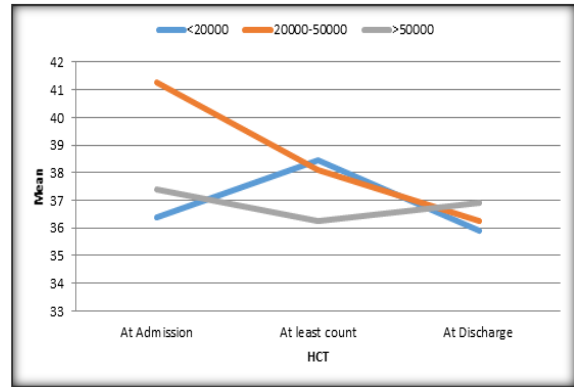

**Graph 20: Platelet and HCT**

Of all cases there was significant association between platelet count and hematocrit (HCT) only on the day of admission (P Value – 0.003).
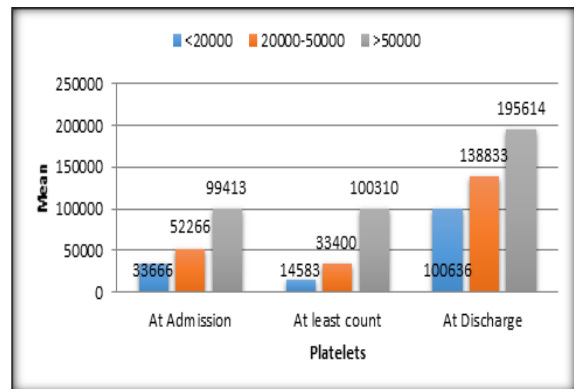

**Graph 21: Platelet and Platelets Count**
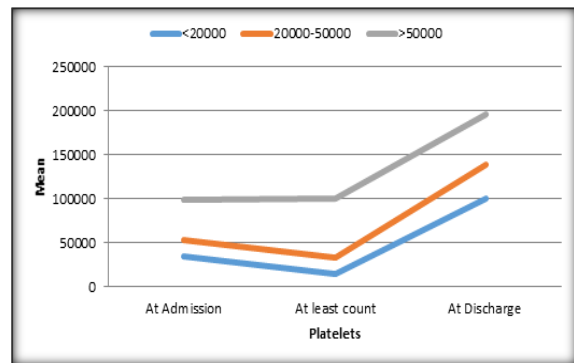

**Graph 21: Platelet and Platelets Count**
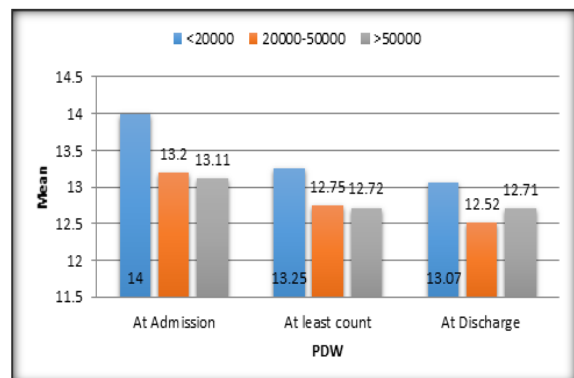

**Graph 22: Platelets and PDW**
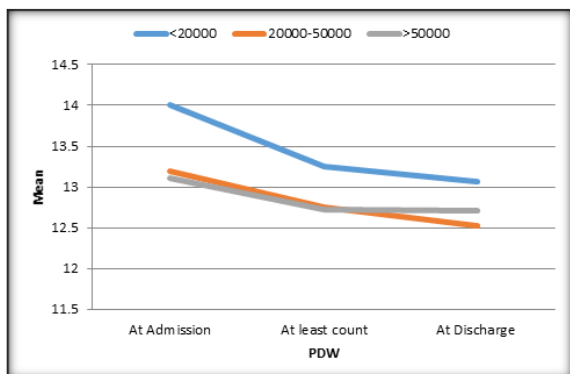
**Graph 22: Platelets and PDW**

There was a significant association between platelet count and Platelet distribution width (PDW) at admission P Value 0.007. Highest PDW (14±0.80) was present at admission in subjects group having count less than 20000 per microlitre.
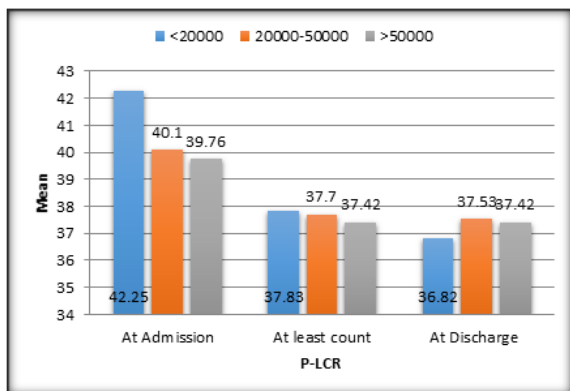

**Graph 23: Platelets and P-LCR**
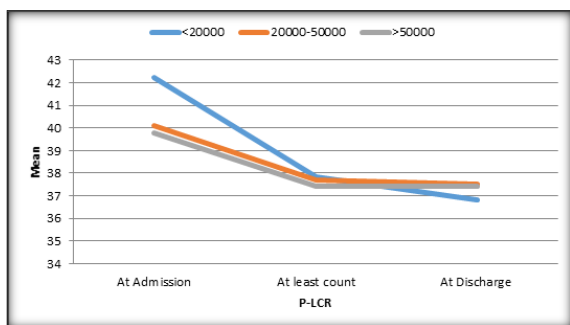
**Graph 23: Platelets and P-LCR**

In all cases there is no significant association between platelet count and platelet large cell ration (P-LCR).
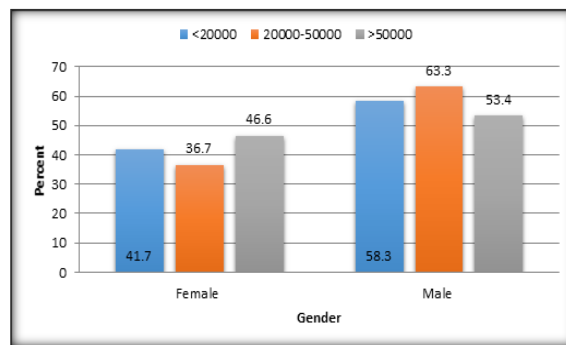

**Graph 24: Platelets and Gender**

There is no association between platelet count and gender of the subjects.
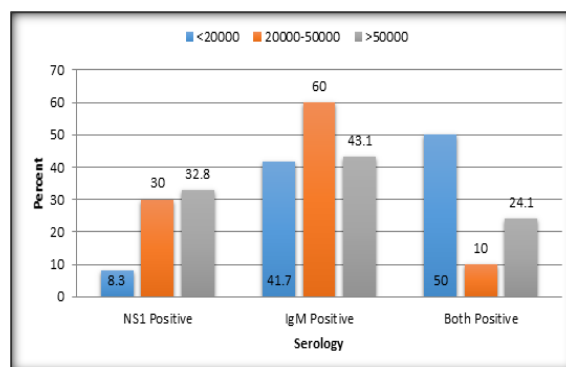

**Graph 25: Platelets and Serology**

There is no significant association between platelet count and serology in the subjects.
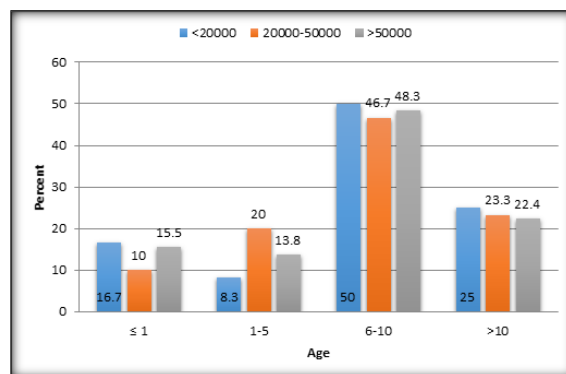

**Graph 26: Platelets and Age**

There is no significant association between platelet count and age of the subjects.

**Table 1: Distribution of Study Subjects according to their Age Group (N = 100)**

| Age (in Years) | No. | Percent |
|---|---|---|
| ≤ 1 | 14 | 14.0 |
| 1-5 | 15 | 15.0 |
| 6-10 | 48 | 48.0 |
| >10 | 23 | 23.0 |
| Mean (SD) | 7.45 (3.76) | |
| Range | 0.4-14.0 | |

**Table 2: Distribution of Study Subjects according to the Gender (N=100)**

| Gender | No. | Percent |
|---|---|---|
| Male | 57 | 57.0 |
| Female | 43 | 43.0 |

**Table 3: Distribution of Study Subjects according to the Serology (N=100)**

| Serology | No. | Percent |
|---|---|---|
| NS1 Positive | 29 | 29.0 |
| IgM Positive | 48 | 48.0 |
| Both Positive | 23 | 23.0 |

**Table 4: Distribution of Study Subjects according to the HB (N=100)**

| HB | Mean (SD) | Range |
|---|---|---|
| At Admission | 12.27 (1.97) | 6.7-18.0 |
| At least count | 11.68 (2.08) | 4.0-16.7 |
| At Discharge | 11.54 (1.46) | 6.7-14.0 |

**Table 5: Distribution of Study Subjects according to the HCT (N=100)**

| HCT | Mean (SD) | Range |
|---|---|---|
| At Admission | 38.44 (5.60) | 22.90-51.70 |
| At least count | 37.08 (5.84) | 12.20-51.00 |
| At Discharge | 36.59 (4.51) | 22.40-62.00 |

**Table 6: Distribution of Study Subjects according to the Platelet (N=100)**

| Platelet | Mean (SD) | Range |
|---|---|---|
| At Admission | 77380 (63975) | 8000-456000 |
| At least count | 69950 (61029) | 7000-343000 |
| At Discharge | 167571 (83393) | 2200-471000 |

**Table 7: Distribution of Study Subjects according to the PDW (N=100)**

| PDW | Mean (SD) | Range |
|---|---|---|
| At Admission | 13.24 (0.91) | 11.4-16.0 |
| At least count | 12.79 (0.75) | 11.4-14.9 |
| At Discharge | 12.69 (0.72) | 11.1-14.2 |

**Table 8: Distribution of Study Subjects according to the P-LCR (N=100)**

| P-LCR | Mean (SD) | Range |
|---|---|---|
| At Admission | 40.16 (3.86) | 30-47 |
| At least count | 37.55 (2.91) | 30-45 |
| At Discharge | 37.39 (2.43) | 41-43 |

**Table 9: Distribution of Study Subjects according to the Platelet Lowest Count (N=100)**

| Platelet | No. | Percent |
|---|---|---|
| <20000 | 12 | 12.0 |
| 20000-50000 | 30 | 30.0 |
| >50000 | 58 | 58.0 |

**Table 10: Distribution of Study Subjects according to the Diagnosis (N=100)**

| Diagnosis | No. | Percent |
|---|---|---|
| Severe Dengue | 9 | 9.0 |
| DF | 64 | 64.0 |
| DF WS | 27 | 27.0 |

**Table 11: Association between Diagnosis and HB (N=100)**

| HB | Severe Dengue | DF | DF WS | P Value |
|---|---|---|---|---|
| At Admission | 11.96 (3.83) | 12.27 (1.76) | 12.38 (1.64) | 0.862 |
| At least count | 9.40 (3.78) | 11.68 (1.47) | 12.43 (2.11) | 0.001* |
| At Discharge | 10.80 (2.56) | 11.57 (1.37) | 11.75 (1.11) | 0.235 |
| ANOVA, P Value * Significant | | | | |

**Table 12: Association between Diagnosis and HCT (N=100)**

| HCT | Severe Dengue | DF | DF WS | P Value |
|---|---|---|---|---|
| At Admission | 37.13 (9.60) | 38.46 (5.31) | 38.83 (4.71) | 0.736 |
| At least count | 32.91 (11.24) | 36.58 (3.95) | 39.66 (6.31) | 0.005* |
| At Discharge | 35.25 (6.14) | 36.28 (3.54) | 37.81 (5.78) | 0.227 |
| ANOVA, P Value * Significant | | | | |

**Table 13: Association between Diagnosis and Platelets (N=100)**

| Platelets | | Severe Dengue | DF | DF WS | P Value |
|---|---|---|---|---|---|
| At Admission | | 62111 (36360) | 87593 (73574) | 58259 (36661) | 0.102 |
| At least count | | 60000 (72284) | 83359 (66135) | 41481 (25646) | 0.009* |

| | At Discharge | 174666 (112273) | 164317 (74843) | 173000 (94773) | 0.875 |
|---|---|---|---|---|---|
| ANOVA, P Value * Significant | | | | | |

**Table 14: Association between Diagnosis and PDW (N=100)**

| PDW | Severe Dengue | DF | DF WS | P Value |
|---|---|---|---|---|
| At Admission | 13.83 (0.77) | 13.12 (0.91) | 13.34 (0.91) | 0.075 |
| At least count | 13.48 (0.53) | 12.62 (0.69) | 12.97 (0.78) | 0.001* |
| At Discharge | 13.26 (0.53) | 12.66 (0.66) | 12.56 (0.85) | 0.036* |
| ANOVA, P Value * Significant | | | | |

**Table 15: Association between Diagnosis and P-LCR (N=100)**

| P-LCR | Severe Dengue | DF | DF WS | P Value |
|---|---|---|---|---|
| At Admission | 42.78 (3.11) | 39.84 (3.70) | 40.04 (4.23) | 0.100 |
| At least count | 38.38 (3.93) | 37.68 (2.44) | 36.96 (3.53) | 0.375 |
| At Discharge | 36.78 (2.53) | 37.86 (2.22) | 36.46 (2.64) | 0.034* |
| ANOVA, P Value * Significant | | | | |

**Table 16: Association between Diagnosis and Gender (N=100)**

| Gender | Severe Dengue | DF | DF WS |
|---|---|---|---|
| Female | 4 (44.4) | 25 (39.1) | 14 (51.9) |
| Male | 5 (55.6) | 39 (60.9) | 13 (48.1) |
| Chi-Square Test, P Value = 0.528, Not Significant | | | |

**Table 17: Association between Diagnosis and Serology (N=100)**

| Serology | Severe Dengue | DF | DF WS |
|---|---|---|---|
| NS1 Positive | 1 (11.1) | 20 (31.3) | 8 (29.6) |
| IgM Positive | 6 (66.7) | 31 (48.4) | 11 (40.7) |
| Both Positive | 2 (22.2) | 13 (20.3) | 8 (29.6) |
| Chi-Square Test, P Value = 0.595, Not Significant | | | |

**Table 18: Association between Diagnosis and Age (N=100)**

| Age (in Years) | Severe Dengue | DF | DF WS |
|---|---|---|---|
| ≤ 1 | 1 (11.1) | 11 (17.2) | 2 (7.4) |
| 1-5 | 2 (22.2) | 7 (10.9) | 6 (22.2) |
| 6-10 | 3 (33.3) | 32 (50.0) | 13 (48.1) |
| >10 | 3 (33.3) | 14 (21.9) | 6 (22.7) |
| Mean (SD) | 8.11 (4.07) | 7.30 (3.82) | 7.57 (3.62) |
| Chi-Square Test, P Value = 0.646, Not Significant | | | |

**Table 19: Association between Platelet Count and HB (N=100)**

| HB | <20000 | 20000-50000 | >50000 | P Value |
|---|---|---|---|---|
| At Admission | 11.60 (1.95) | 13.20 (1.81) | 11.93 (1.91) | 0.007* |
| At least count | 11.11 (3.41) | 12.24 (1.54) | 11.50 (1.95) | 0.174 |
| At Discharge | 10.69 (1.71) | 11.65 (1.17) | 11.65 (1.51) | 0.117 |
| ANOVA, P Value * Significant | | | | |

**Table 20: Association between Platelet Count and HCT (N=100)**

| HCT | <20000 | 20000-50000 | >50000 | P Value |
|---|---|---|---|---|
| At Admission | 36.40 (5.43) | 41.27 (4.59) | 37.40 (5.65) | 0.003* |
| At least count | 38.46 (8.66) | 38.11 (4.42) | 36.27 (5.77) | 0.260 |
| At Discharge | 35.90 (3.26) | 36.25 (3.39) | 36.90 (5.21) | 0.710 |
| ANOVA, P Value * Significant | | | | |

**Table 21: Association between Platelet Count and Platelets (N=100)**

| Platelets | <20000 | 20000-50000 | >50000 | P Value |
|---|---|---|---|---|
| At Admission | 33666 (17890) | 52266 (33419) | 99413 (72460) | <0.001* |
| At least count | 14583 (4581) | 33400 (8668) | 100310 (64345) | <0.001* |
| At Discharge | 1000636 (44163) | 138833 (78866) | 195614 (79710) | <0.001* |
| ANOVA, P Value * Significant | | | | |

**Table 22: Association between Platelet Count and PDW (N=100)**

| PDW | <20000 | 20000-50000 | >50000 | P Value |
|---|---|---|---|---|
| At Admission | 14.00 (0.80) | 13.20 (0.75) | 13.11 (0.94) | 0.007* |
| At least count | 13.25 (0.95) | 12.75 (0.71) | 12.72 (0.70) | 0.073 |
| At Discharge | 13.07 (0.70) | 12.52 (0.69) | 12.71 (0.72) | 0.093 |
| ANOVA, P Value * Significant | | | | |

**Table 23: Association between Platelet Count and P-LCR (N=100)**

| P-LCR | <20000 | 20000-50000 | >50000 | P Value |
|---|---|---|---|---|
| At Admission | 42.25 (3.86) | 40.10 (3.85) | 39.76 (3.79) | 0.125 |
| At least count | 37.83 (3.40) | 37.70 (3.48) | 37.42 (2.50) | 0.862 |
| At Discharge | 36.82 (2.22) | 37.53 (2.16) | 37.42 (2.61) | 0.701 |
| ANOVA, P Value * Significant | | | | |

**Table 24: Association between Platelet Count and Gender (N=100)**

| Gender | <20000 | 20000-50000 | >50000 |
|---|---|---|---|
| Female | 5 (41.7) | 11 (36.7) | 27 (46.6) |
| Male | 7 (58.3) | 19 (63.3) | 31 (53.4) |
| Chi-Square Test, P Value = 0.671, Not Significant | | | |

**Table 25: Association between Platelet Count and Serology (N=100)**

| Serology | <20000 | 20000-50000 | >50000 |
|---|---|---|---|
| NS1 Positive | 1 (8.3) | 9 (30.0) | 19 (32.8) |
| IgM Positive | 5 (41.7) | 18 (60.0) | 25 (43.1) |
| Both Positive | 6 (50.0) | 3 (10.0) | 14 (24.1) |
| Chi-Square Test, P Value = 0.052, Not Significant | | | |

**Table 26: Association between Platelet Count and Age (N=100)**

| Age (in Years) | <20000 | 20000-50000 | >50000 |
|---|---|---|---|
| ≤ 1 | 2 (16.7) | 3 (10.0) | 9 (15.5) |
| 1-5 | 1 (8.3) | 6 (20.0) | 8 (13.8) |
| 6-10 | 6 (50.0) | 14 (46.7) | 28 (48.3) |
| >10 | 3 (25.0) | 7 (23.3) | 13 (22.4) |
| Mean (SD) | 7.79 (3.91) | 7.77 (3.71) | 7.21 (3.80) |
| Chi-Square Test, P Value = 0.962, Not Significant | | | |

## DISCUSSION

Dengue fever is one of the major public health problems. Defect in DF/DHF are multifactorial mechanisms that include thrombopathy, coagulopathy and vasculopathy. Thrombopathy means the thrombocytopenia and platelet dysfunction. Many factors can contribute to the onset of thrombocytopenia in dengue, varying from a reactive immune response against platelets to decreased platelet production.[9,10,11,12] The depression in the bone marrow observed in dengue fever in the acute stage may account for thrombocytopenia. In addition, direct infection of megakaryocytes by dengue virus could lead to an increased destruction of platelets.[13] As the platelets are natural sources of growth factors like platelet derived growth factor (PDGF), vascular endothelial growth factor (VEGF), insulin-like growth factor 1 (IGF-1) or transforming growth factor β (TGF-β), they have important role in inflammation, angiogenesis, repair and regeneration of the tissues.[17]

The present study correlates with the previous study in age incidence and the observation that no significant difference in age was noted between dengue with/without shock. The mean age group of presentation of children with dengue infection in the present study was 7.45± 3.76 years which is comparable with Chandrakanta et al,[18] Alam et al,[19] Ahmed et al.[20] The study made use of two commercial kits ELISA and Pan Bio ELISA kits which showed high degree sensitivity and specificity in the global testing centres and were highly recommended for the purpose. There was a significant statistical correlation between haematocrit and severity of the disease among the clinical subgroups of dengue. All of the patients presented were analysed for Platelet count, PDW, P-LCR. In our study we found that Platelet count were lower in all dengue fever patients on the day of admission and PDW and P-LCR levels were higher in all dengue fever patients irrespective of severity. We noticed that PDW level was significantly higher in the dengue fever, which reflect that increasing PDW levels may predict dengue fever. We found that in the clinical spectrum of severity of Dengue, From DF group to severe dengue, highly significant association (p value <0.001) was noted between the various groups as Low platelet count, High PDW, High P-LCR.

## CONCLUSION

This prospective observational study was conducted during January 2019 to April 2021. During this study period 100 cases of serologically diagnosed dengue fever were evaluated and analysed for laboratory parameters. Among these 100 cases, 64 were classical dengue fever, 27 were dengue fever with warning signs, 9 were severe dengue cases. Among these patients, 57% were male, 43% were female.48% of cases were in the 6-10-year age group. Mean Hemoglobin in case group is 11.83 gm/dl. Mean Hematocrit in case group is 38.44 %. Statistical analysis showed no association between hemoglobin, hemoconcentration levels with Dengue fever. There was significant association between PDW and dengue fever irrespective of severity (p value < 0.001) on all days (admission day, on the

day of least count and on discharge). However there is no significant association between platelet large cell ratio and dengue fever. There was a significantly higher PDW, P-LCR in severe dengue group as compared to DF group (p<0.001). There was a significant negative correlation with PDW, P-LCR (p – 0.003; r = -0.293). There was significant relation between PDW and platelet count on all days irrespective of severity suggesting PDW can be taken as a prognostic marker for platelet count.

# REFERENCES

1. WHO/TDR. Dengue guidelines for diagnosis, treatment, prevention and control. New edition. Geneva, World Health Organization, 2009. Avaialble at http://apps.who.int/iris/bitstream/10665/44188/1/9789241547871_eng.pdf
2. Chuang YC, Lin YS, Liu CC, Liu HS, Liao SH, Shi MD, Lei HV, Yeh TM. Factors contributing to the disturbance of coagulation and fibrinolysis in dengue virus infection. J Formos Med Assoc. 2013; 112(1): 12-7.
3. Vagdatli E, Gounari E, Lazaridou E, KatsibourliaE,TsikopoulouF,LabrianouI.Platelet distribution width:a simple,practical and specific marker of activation of coagulation.HIPPOKRATIA.2010;14(1):28-32.
4. Bowles KM, Cooke LJ, Richards EM, Baglin TP. Platelet size has a diagnostic value in patients with thrombocytopenia. Clin lab Haem. 2005; 27:370-373.
5. Wiwanikit V. Mean platelet volume in patients with dengue haemorrhagic fever. Platelets. 2004; 15(3): 185.
6. Babu E, Basu D. Platelet Large cell ratio in the differential diagnosis of abnormal platelet counts. Indian J PatholMicrobiol. 2004: 47 (2):202-5.
7. Ntaios G, Papadopoulus A, Chatzinikolaou A et al. Increased value of MPV and platelet size deviation width may provide a safe ppositive diagnosis of idiopathic thrombocytopenic purpura. Acta haematologica.2008;119:173-177.
8. WHO. Dengue hemorrhagic fever: Diagnosis, Treatment, prevention and control, 2nd ed. Geneva World Helath Organisation, 1997.
9. Guzman MG, Halstead SB, Artsob H, Buchy P, Farrar J, Gubler DJ, et al. Dengue: A continuing global threat. NatRevMicrobiol. 2010;8 (12 Suppl):7–16.
10. Kaushik A, Pineda C, Kest H. Diagnosis and management of dengue fever in children. Pediatr Rev. 2010 Apr;31(4): e28-35.
11. Rueda E, Mendez A, Gonzalez G. Hemophagocytic syndrome associated with dengue hemorrhagic fever. Biomedica. 2002 Jun;22(2):160-6.
12. Kabilan L, Balasubramanian S, Keshava SM, Satyanarayana K. The 2001 dengue epidemic in Chennai. Indian J Pediatr. 2005 Nov;72(11):919-23.
13. George R, liam CK, Chua CT, Lam SK, Pang T, Geethan R, FOO LS. Unusual clinical manifestations of dengue virus infection. Southeast Asian J Trop Med Public Health. 1998 Dec;19(4):585-90.
14. Lum LC, Lam SK, George R, Devi S. Fulminant hepatitis in dengue infection. Southeast Asian J Trop med public Health. 1993 Sep;24(3):467-71.
15. Chye JK, lim CT, Ng KB, Lim JM, George R, Lam SK. Vertical transmission of dengue. Clin Infect Dis. 1997 Dec;25(6):1374-7.
16. George R, liam CK, Chua CT, Lam SK, Pang T, Geethan R, FOO LS. Unusual clinical manifestations of dengue virus infection. Southeast Asian J Trop Med Public Health. 1998 Dec;19(4):585-90.
17. LumLC, Lam SK, Choy YS, George R, Harun F. Dengue encephalitis: a true entity? Am J Trop Med Hyg. 1996 Mar;54(3):256-9.
18. Chandrakanta, Rashmi & Kumar, & Kapoor, Garima & Agarwal, Amita & Jain, Rachna & Nagar, (2008). Changing clinical manifestations of dengue infection in north India. Dengue Bulletin.
19. Utama IMS, Lukman N, Sukmawati DD, Alisjahbana B, Alam A, et al. (2019) Dengue viral infection in Indonesia: Epidemiology, diagnostic challenges, and mutations from an observational cohort study. PLOS Neglected Tropical Diseases 13(10): e0007785. https://doi.org/10.1371/journal.pntd.0007785.
20. Ahmed, Sundus & Finkelstein, Julia & Stewart Ibarra, Anna & Kenneth, John & Polhemus, Mark & Endy, Timothy & Cárdenas, Washington & Mehta, Saurabh. The American journal of tropical medicine and hygiene 91(5):2014.