

EVALUATION OF PLATELET COUNTS AND PLATELET INDICES AND THEIR SIGNIFICANT ROLE IN PRE-ECLAMPSIA AND ECLAMPSIAVijaya C¹, Lekha M. B², Archana Shetty³, Geethamani V⁴**HOW TO CITE THIS ARTICLE:**

Vijaya C, Lekha M. B, Archana Shetty, Geethamani V. "Evaluation of Platelet Counts and Platelet Indices and their Significant Role in Pre-eclampsia and Eclampsia". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 12, March 24; Page: 3216-3219, DOI: 10.14260/jemds/2014/2269

ABSTRACT BACKGROUND: Preeclampsia and eclampsia are the most leading cause of maternal mortality in developing countries like ours. The aim of our study is to find out the relation between platelet indices and platelet counts with preeclampsia and eclampsia and their significance as prognostic indicator. **MATERIALS AND METHOD:** 82 cases of preeclampsia and 63 cases of eclampsia diagnosed between September 2010 to December 2013 were evaluated prospectively. One hundred healthy pregnant women with similar demographic features and gestational age without diagnosis of preeclampsia were included in the study of control group. Blood samples were analyzed by automated hematology analyzer. The platelet count, mean platelet volume and platelet distribution width were compared. **RESULTS:** The platelet counts were lower while mean platelet volume, platelet distribution width were increased in preeclampsia and eclampsia as compared to control group. **CONCLUSION:** We found an association between platelet indices and severity of preeclampsia. The estimation of platelet indices can be considered as an early, simple and rapid procedure in the assessment of severity of preeclampsia and eclampsia which can be used as a prognostic marker.

KEYWORDS: Pregnancy, Pre-eclampsia, Platelet Indices.

INTRODUCTION: Preeclampsia is one of the commonest medical disorders during pregnancy and affects approximately 5–10% of all pregnancies mostly affecting the primigravida. It continues to be major causes of maternal and perinatal morbidity and mortality¹. It is a multisystem disease and many theories are proposed for pathophysiology. So there is a constant search for better prognostic factors to predict the progression and severity of disease. Activation of coagulation, fibrinolysis, platelet and vascular endothelial function are believed to play an important role in pathogenesis of preeclampsia. The fall in platelet count is most frequently found in preeclampsia and is probably due to consumption during low grade intravascular coagulation². Thus, the aim of the study is to assess the relationship between severity of preeclampsia and platelet indices and whether these indices can be used as prognostic markers.

MATERIALS & METHODS: This 2year 4 months prospective study was conducted in the department of pathology between September 2010 to December 2013, on patient attending antenatal clinic and/or admitted in maternity wards. The cases with systolic blood pressure between 140 and 160 mg and diastolic 90 and 110mmHg in association with proteinuria, were included in the preeclampsia group. The cases with the blood pressure greater than 160/110 mm Hg, proteinuria, and oliguria were included in the eclampsia group. A total of 145 cases were studied after taking informed consent. 82 cases were diagnosed as preeclampsia and 63 cases were diagnosed as eclampsia.

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One hundred healthy pregnant women with similar demographic feature and gestational age were included in the study as control group.

Blood sample were analyzed by automated hematology analyzer (Pentra 60, German make) for platelet count, platelet indices like platelet distribution width (PDW) and mean platelet volume (MPV). The statistical analysis performed on entire samples used was mean, standard deviation, one way ANOVA and Fischer F value. The P value less than 0.05 was accepted as significant. This study is been approved by institutional ethical committee.

RESULT: Total number of patient analyzed was 145, in which 82 were diagnosed as preeclampsia and 63 as eclampsia. The mean age range of the pregnant women in the present study was 24.57+3.46 year. The platelet count in preeclampsia and eclampsia patients had significantly decreased when compared with control group. The platelet count decreased during the course of normal pregnancy but it was nonsignificant, while significant and rapid decline in platelets count was observed in preeclampsia and eclampsia cases which was directly proportional to the severity of Hypertension (Table 1).

Parameter	Control group	Preeclampsia	Eclampsia	Fischer F. Value	P. value
Platelet Count (lacs/mm ³)	2.18.400+28.250	1.55.500+31.300	1.31.000+33.280	170.59	<0.0001

TABLE 1: COMPARISON OF PLATELET COUNT BETWEEN CONTROL, PREECLAMPSIA AND ECLAMPSIA CASES

The MPV & PDW values were elevated even in normotensive pregnant women which were nonsignificant. Both values were elevated proportionally with the severity of preeclampsia and eclampsia, when compared with control group. Significant changes in MPV & PDW were seen with a rise in Blood pressure. (Table II)

Parameter	Control group	Pre-eclampsia	Eclampsia	Fischer F. Value	P .Value
Man platelet volume (μ m ³)	8.64+ 1.34	10.38+ 1.66	11.08+2.24	42.67	<0.0001
Platelet distribution width (%)	11.08+2.42	15.50+2.68	16.78+3.13	42.01	<0.0001

TABLE 2: COMPARISON OF MEAN PLATELET VOLUME AND PLATELET DISTRIBUTION WIDTH BETWEEN CONTROL AND PRE-ECLAMPSIA, ECLAMPSIA

DISCUSSION: Pregnancy is associated with complex changes involving blood coagulation, a transient mild thrombocytopenia is seen due to increased platelet consumption³. Hypertension is one of the most common obstetric problems resulting in preeclampsia and eclampsia which in turn associated with thrombocytopenia⁴. The obstetrician nowadays rely increasingly on laboratory test for the management of pregnant women⁵. The most common cause of thrombocytopenia in pregnancy is preeclampsia and eclampsia and also found associated with increased risk of perinatal complications

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such as abruptio placenta, preterm delivery, low Apgar score and still birth⁶⁻⁸. The estimation of platelet indices is a reliable method⁹. In this study an attempt has been made to assess the role of platelet indices in preeclampsia and eclampsia when compared with normotensive pregnant women.

Severity of PIH and thrombocytopenia observed are closely correlated which indicates that thrombocytopenia is directly proportional to severity of PIH. The platelet in our series were: normotensive pregnant women-2, 18, 400 lacs/mm³, preeclampsia-1, 55, 500 lacs/mm³ and eclampsia-1, 31, 000 lacs/mm³. When value of platelet count estimation was compared between the normotensive pregnant women with preeclampsia and eclampsia, a significant decrease in platelet number was observed. The platelet count in our series was compared which correlated well with the values of other studies^{8,10} (Table .3).

	Mohapatra et al ⁸	Vrunda et al ¹⁰	Present study
Normotensive	2.38.000	2.20.000	2.18.400
Preeclampsia	1.82.000	1.40.000	1.55.500
Eclampsia	1.30.000	1.30.000	1.31.000

TABLE 3: COMPARISON OF PLATELET COUNTS (IN LACS/MM³) REPORTED BY VARIOUS AUTHORS AND PRESENT STUDY IN RELATION TO SEVERITY OF PIH

There was an increase in MPV and PDW value from normotensive pregnant women to preeclampsia and eclampsia in the present study which correlated with other study. The increase in MPV&PDW in preeclampsia and eclampsia probably indicates increased platelet turn over which would support the evidence that platelet survival time is decreased resulting in increased distribution of platelets^{5,11} (Table.4).

	Parameter	Annam et al ⁵	Giles et al ¹¹	Present study
Normotensive	MPV	8.6	87	8.64
	PDW	11.07	12	11.08
Pre eclampsia	MPV	10.3	9.9	10.38
	PDW	15.51	16	15.50
Eclampsia	MPV	11	NA	11.08
	PDW	16.78	19	16.78

TABLE 4: COMPARISON OF MEAN PLATELET VOLUME AND PLATELET DISTRIBUTION WIDTH REPORTED BY VARIOUS STUDIES AND PRESENT STUDY IN RELATION TO SEVERITY OF PIH

Thus increase in MPV, PDW may form basis for prediction of pre-eclampsia and eclampsia in pregnancy and can also be considered as a prognostic marker as the platelet counts and indices correlates with severity of the disease.

CONCLUSION: The present study revealed that low platelet count is associated with preeclampsia and eclampsia. The estimation of platelet indices can be considered as early, economical and rapid procedures of assessment of severity of PIH cases. Clinically platelet indices can be a useful screening test for early identification of preeclampsia and eclampsia. Also platelet indices can assess the

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prognosis of this disease in pregnant women and can be used as an effective prognostic marker because it correlates with severity of the disease.

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AUTHORS:

1. Vijaya C.
2. Lekha M. B.
3. Archana Shetty
4. Geethamani V.

PARTICULARS OF CONTRIBUTORS:

1. Professor and HOD, Department of Pathology, Sapthagiri Institute of Medical Science and Research Center, Bangalore.
2. Assistant Professor, Department of Pathology, Sapthagiri Institute of Medical Science and Research Center, Bangalore.
3. Assistant Professor, Department of Pathology, Sapthagiri Institute of Medical Science and Research Center, Bangalore.

4. Professor and HOD, Department of Pathology, BGS Global Institute of Medical Sciences and Hospital, Bangalore.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Vijaya C,
Professor and HOD,
Department of Pathology,
Sapthagiri Institute of Medical Science and Research
Centre, Street No.15, Hesaraghatta Main Road,
Chikkasandra, Bangalore - 560090.
E-mail: vijayakrshn0@gmail.com

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