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Platlet Counts Decrease with Severity of Pre-Eclampsia

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Abstract

Background: The aim of this study is to find out the relationship between platelet indices and platelet counts with pre-eclampsia.

Methods: Hospital based comparative study conducted at department of Obstetrics and Gynaecology, SMS medical college and associated hospitals, Jaipur.

Results: That mean Platelet (10^3/ul) count in group B (severe preecclampsia) 2.10±0.14, that was significantly as compared to group B (severe preeclampsia) 2.46±0.51 with p value<0.001.

Conclusion: The mean platelet count was significantly decrease in severe preeclampsia group than mild preeclampsia group.

Keywords: Platelet count, Preeclampsia, Severe.

Introduction

Preeclampsia is a syndrome characterized by hypertension and proteinuria developing after 20 weeks of gestation. It affects approximately 6–8% of all pregnancies, most often the primigravidas[1]. It is one of the most important causes of maternal and fetal morbidity and mortality. Many theories are proposed for the pathophysiology of preeclampsia. The formation of a uteroplacental vasculature insufficient to supply adequate blood to the developing fetus results in fetoplacental hypoxia, leading to imbalances in the release and metabolism of prostaglandins, endothelin, and nitric oxide by placental and extraplacental tissues. These as well as enhanced lipid peroxidation and other undefined factors contribute to the hypertension, platelet activation and systemic endothelial dysfunction characteristics of preeclampsia. [2] Activation of coagulation system in small vessels and increased platelet aggregation is present in preeclampsia. It is clear that preeclampsia is one of the causes of maternal thrombocytopenia and the platelet count increases rapidly after the delivery. There are studies suggesting the storage of platelet in the areas with endothelial damage, as the cause of thrombocytopenia [3].

Material and Methods

Type of Study: Hospital based comparative study.

Study Design: Cross sectional study.

Place of Study: Department of Obstetrics and Gynaecology, SMS medical college and associated hospitals, Jaipur.

Duration: From June 2018 to august 2019.

Study Participants: Pregnant women over 20 weeks of gestation with mild preeclampsia, and severe preeclampsia.

Sample Size: Sample size was calculated at 95% confidence level assuming standard deviation of 3.1 in neutrophil lymphocyte ratio as per results of seed article.

At the precision of 1, minimum 37 preeclampsia patients were required as sample size, which was further enhanced to 41 preeclampsia patients in each group as final sample size, expecting 10% attrition.

Sampling Procedure: 41 pregnant (>20 weeks) women having mild pre eclampsia and 41 pregnant (>20 weeks) women having severe pre eclampsia were included on first cum first basis after beginning the study assuming 10% drop outs.

Inclusion Criteria: A singleton pregnancy over 20 weeks of gestation with mild preeclampsia and with severe preeclampsia.

Exclusion Criteria

1. Patients with history of chronic renal disease.
2. Chronic Hypertension.
3. History of pre-existing diabetes or gestational diabetes.
4. Cardiovascular illness.
5. Any infectious diseases.
6. Chronic medical disorders.
7. History of smoking.
8. Those with a fetal structural or genetic anomaly.
9. History of membrane rupture.

Methodology

- All eligible pregnant women fulfilling inclusion criteria were explained about nature and purpose of the study.
- After taking their informed written consent, detail history, general and systemic examination was done.
- Blood samples was collected in tubes containing EDTA vial.
- The neutrophil counts and lymphocyte counts were estimated and then neutrophil lymphocyte ratio was calculated.
- All information and reports was recorded on a pre designed Proforma and was entered in Microsoft excel sheet to prepare master chart.

Statistical Analysis

- Appropriate parametric test was used for linear variables and non parametric tests was used for categorical variables as per natural and yield of data.
- P value <0.05 was considered as significant data was analysed using medcalc 16.4 version statistical software.

Results

Table 1: Comparison of mean Platelet (10^3/ul) count between mild and severe cases

		Group A Mild preeclampsia	Group B Severe preeclampsia	p value
	Sample Size	n = 41	n = 41	
Platelet (10^3/ul)	Mean ± SD	2.46±0.51	2.10±0.14	p<0.001
	Median	2	2	

Above table shows that mean Platelet (10^3/ul) count in group B (severe preecclampsia) 2.10±0.14, that was significantly as compared to group B (severe preeclampsia) 2.46±0.51 with p value<0.001.

Table 2: Comparison of mean PDW and RDW between 2 Groups

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		Group A Mild preeclampsia	Group B Severe preeclampsia	p value
	Sample size	n = 41	n = 41	
PDW (fl)	Mean ± SD	12.17±1.70	14.12±3.11	0.0007
	Median	12	14	
RDW SD	Mean ± SD	42.25±8.36	48.27±6.85	0.0006
	Median	38	47	
RDW CV	Mean ± SD	18.22±3.51	19.04±5.05	0.394
	Median	17	18	

Table No 2 shows mean PDW, RDW-SD level in group B severe preeclampsia 14.12±3.11, 48.27±6.85 respectively was highly significant as compared to group A mild preeclampsia 12.17 ± 1.70, 42.25 ± 8.36 respectively with ($p<0.05$).

The mean RDW-CV value of severe PE group was also higher i.e. 19.04±5.05 than mild PE group 18.22±3.51, but is not significant (p value 0.394).

Discussion

Mean platelet count(10^3/L) in severe preeclampsia group was 2.10 ±0.14, which was significantly decreased ($p <0.001$) than mild preeclampsia group i.e. 2.46±0.51 and mean heamoglobin (gm/dl) level in severe preeclampsia group was group 9.78 ±0.38 which was significantly decreased ($p <0.001$) than mild preeclampsia group i.e. 10.56±0.68. similar results were reported by Kholief A[4] (2019). Mean MCV (fl) level in severe group was 76.54±6.72 as compared to 83.76±9.31 in mild group which was highly significant as the p value was 0.0001. These findings were in accordance to the study done by Sumerya Nergiz et al[5] (2015).Mean MCH (pg/dl) level in severe pre-eclampsia group was 24.14±2.86 and of mild preeclampsia group was 25.61±4.10. There was no statistical significance as pvalue came out to be >0.05.Simlarly mean MCHC (gm/dl) in mild preeclampsia was 30.85±2.30 as compared to 30.80±1.79 in severe preeclampsia, this difference was also not significant. These result similar to study conducted Sumerya Nergiz et al[5](2015). In our study the mean RDW-SD values of severe PE group were higher 48.27±6.85 than mild PE group values 42.25±8.36. The mean RDW-CV value of severe PE group was also higher i.e. 19.04±5.05 than mild PE group 18.22±3.51, but is not significant (p value 0.394). We observed an increase in RDW values in severe PE group so these values indicates the severity of PE. Similar results found in study of Raziye Keskin Kurt et al[6] (2013). PDW(fl) level in mild PE was 12.17±1.70 and in severe group was 14.12±3.11.The difference was statistically significant (as p value 0.0007). Wael Ahmed Ezzat kamel Ammar et al[7] (2014) had similar results in his study.

Conclusion

The mean platelet count was significantly decrease in severe preeclampsia group than mild preeclampsia group.

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