Correlative Study of Platelet Count with Platelet Indices in Preeclampsia

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Abstract

Hypertensive disorders complicate 5%-10% of all pregnancies and together they form one member of the deadly triad-Hypertension, Haemorrhage and Infection Preeclamsia is a syndrome charecterised by hypertention and proteinuria developing after 20 weeks of gestation in a woman with previously normal blood pressure contribute greatly to the fetal morbidity and mortality rates. *Aims and Objectives:* To evaluate the relationship between platelet count and platelet indices in mild and severe pre-eclampsia patients. *Material and Methods:* The study was carried out in the Department of Pathology, ESICMC PGIMSR, Bangalore for one year duration prospectively. The cases which were clinically diagnosed as mild and severe grade of preeclampsia amounting to sixty seven were used for the study. Out of 67, 59 cases were of mild grade and 8 cases were of severe PIH. The statistical analysis was done with mean, standard deviation, one-way ANOVA. *Results:* There was a significant correlation between increase in platelet count with that of PDW and P-LCR with p value of <0.001. *Conclusion:* Platelet count and Platelet indices will be very much helpful to the physician to make a detailed review and to prevent maternal and fetal morbidity and mortality in PIH.

Keywords: Platelet Count; Platelet Indices; PIH; Preeclampsia.

Introduction

Hypertensive disorders complicate 5%-10% of all pregnancies and together they form one member of the deadly triad-Hypertension, Haemorrhage and Infection Preeclamsia is a syndrome charecterised by hypertention and proteinuria developing after 20 weeks of gestation in a woman with previously normal blood pressure contribute greatly to the fetal morbidity and mortality rates [1].

The pathophysiology of preeclampsia has been explained by many theories. One of the most accepted theory explains that the ill-formation of a uteroplacental vasculature leading to insufficient supply of adequate blood to the developing fetus resulting in fetoplacental hypoxia, imbalances in the release and metabolism of prostaglandins, endothelin, and nitric oxide by placental tissue. Along with it enhanced lipid peroxidation and other undefined factors leads to hypertension, platelet activation and systemic endothelial dysfunction forming triad of preeclampsia [2]. There is activation of platelet aggregation and coagulation system in small vessels causing thrombocytopenia [3].

The aim of this study is to evaluate the relationship between the platelet count and platelet indices in preeclampsia.

Aims and Objectives

To evaluate the relationship between platelet count and platelet indices in mild and severe pre-eclampsia patients.

Material and Methods

The study was carried out in the Department of Pathology, ESICMC PGIMSR , Bangalore for one year

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duration prospectively. The cases which were clinically diagnosed as mild and severe grade of preeclampsia amounting to sixty seven were used for the study. Out of 67 , 59 cases were of mild grade and 8 cases were of severe PIH. [Mild preeclampsia: BP 140/90 to 160/110 mm of Hg with proteinuria , Severe preeclampsia: BP > 160/110mm of Hg with proteinuria] The cases of known hypertention, oral anticoagulant therapy, Liver disorders, Vitamin k deficiency, Diabetes were excluded from the study.

In all these cases blood samples were analysed by automated haematology analyser (SYSMEX – 2000i) for platelet count and platelet indices (PCT, MPV, PDW& P-LCR).

Further study group were separated into 5 groups based on the platelet count.

Sl. No.	Platelet count	No. of cases
1	< 0.5 lakh/cu mm	2
2	0.5 to 1lakh /cu mm	3
3	1 to 1.5lakh /cu mm	3
4	1.5 to 4.5lakhs /cu mm	57
5	> 4.5 lakhs /cu mm	2

The statistical analysis was done with mean, standard deviation, one-way ANOVA.

Results

In the present study out of 67 cases 59 were of mild PIH amounting to 88% (Figure 1).

In the present study platelet count is proportionate to plateletcrit . MPV is increased in 50% of the cases. PDW and P-LCR are increased in75% of pregnant women having platelet counts between 1-1.5 lakh / cu mm. Whereas overall results shows reduced platelet counts, plateletcrit, P-LCR in severe eclampsia as
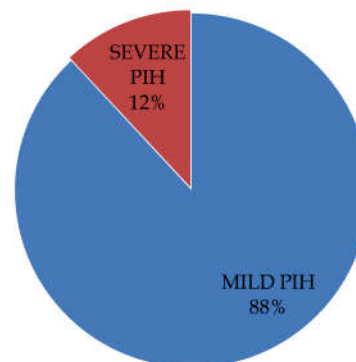

Fig. 1: Pie chart showing percentage of cases with mild and severe PIH

Table 1: Platelet count and platelet indices

	Total cases	Platelet count (mean)	Platelet CRIT (mean)	MPV (mean)	PDW (mean)	P-LCR (mean)
Mild pre-eclampsia	59	2.19	0.24	10.83	13.5	30.94
Severe pre-eclampsia	08	1.8	0.22	11.20	14.1	30.50

Table 2: Correlation of platelet count and platelet indices in mild PIH

Sl. No.	PLT count (Lakh)	Total cases	PCT			MPV		PDW		P-LCR	
			<N	N	>N	N	>N	N	>N	N	>N
1	<0.5	01(1.8%)	01	--	--	01	--	01	--	01	--
2	0.5 -1	03(5%)	03	--	--	03	--	01	02	02	01
3	1-1.5	04(6.7%) mean	04 (100%) (0.17)	--	--	02	02 (50%) (12.1)	01	03 (75%) (16.7)	01	03(75%) (38.4)
4	1.5 -4.5	50(84.8%)	--	46	--	48	02	28	22	37	13
5	>4.5.	01(1.8%) 59 cases	--	--	01	01	--	01	--	01	--

Table 3: Correlation of platelet count and platelet indices in severe PIH

Sl. No.	PLT count (Lakh)	Total cases	PCT			MPV		PDW		P-LCR	
			<N	N	>N	N	>N	N	>N	N	>N
1	<0.5	01(12.5%)	01	--	--	01	--	--	01	01	--
2	0.5 -1	--	--	--	--	--	--	--	--	--	--
3	1-1.5	01(12.5%)	01	--	--	01	--	01	--	01	--
4	1.5 -4.5	06(75%)	--	06	--	06	--	02	04 (66%)	05	01
	Total	08 cases									

compared to that of mild grade. MPV and PDW is increased in severe grade.

There was a significant correlation between increase in platelet count with that of PDW and P-LCR with p value of <0.001.

The estimation of platelet indices can be considered as an early, simple and rapid procedure. Out of these platelet parameters PDW has found to be most reliable in the assessment of the severity of the pre-eclampsia. PDW and P-LCR can be used as a screening test for an early identification of pre-eclampsia.

Discussion

Hypertension is considered as one of the commonest obstetric complication [4]. To differentiate between hypertension and preeclamsia, physicians need a quick reliable laboratory investigations for further plan of treatment. The most essential and basic investigations that are very much needed to classify PIH are, Platelet count, platelet indices, Liver function test, Urine albumin test. Many of the places are not having the facilities to carry out all the above mentioned investigations or it may not be economical for the patients. So this study is carried out to investigate the relationship between platelet counts and platelet indices with that of severity of PIH.

This study is in agreement with the conclusion drawn by Redman et al, who suggests that increased platelet consumption is an early feature of pre-eclampsia [5].

In comparison with other studies like Dunder et al [6], Vamsheedhar et al [1] MPV is increases in PIH cases which correlates with our study. Whereas increase in P-LCR and PDW correlates only with the study of Vamsheedhar et al.

Conclusion

Platelet count and Platelet indices will be very much helpful to the physician to make a detailed review and to prevent maternal and fetal morbidity and mortality in PIH.

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