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Platelet Count – A Prognostic Factor for Preeclampsia

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ABSTRACT

Background: Preeclampsia is a dreaded medical complication in pregnancy and one of the leading causes of maternal and perinatal morbidity and mortality. There has been a constant search for predictors and prognostic factors to better the outcome of such pregnancies. Platelet count is one such factor which has been studied and established as a prognostic factor by many researchers.

Method: 200 women from 28 weeks of gestation were included in the study. 100 Women with no other high risk factors were taken as controls and 100 Women diagnosed with preeclampsia were taken as cases. Platelet counts were done every 4 weekly in controls and every week in subjects starting from 28weeks till delivery. Comparison of platelet count in normal pregnancy & Preeclampsia along with the relationship between platelet count & severity of preeclampsia were studied.

Result: Women in control group and mild preeclampsia group had comparable platelet count. Most women in the severe PE group had platelet counts between 1.5-2.5lakh, 7(15%) had counts between 1-1.5 lakh, 6(12.7%) women had thrombocytopenia of <1lakh. In the eclampsia group, 37.5% women had thrombocytopenia. The mean platelet count in the cases are significantly lower when compared to the controls, and this lowered platelet count was found directly proportional to the severity of preeclampsia.

Conclusion: Platelet count was found to decrease proportionately with increasing severity of preeclampsia indicating its value as a prognostic factor in preeclampsia.

Introduction:

Pregnancy can be just another joyful experience for some and for some other it can be a dreaded one due to a wide variety of complications associated with it. Pregnancy induced hypertension is an idiopathic multi system disorder specific to pregnancy and peurperium. It can be one such medical complication of pregnancy and one of the leading causes of maternal and perinatal morbidity and mortality.

Pre-eclampsia is not only common and dangerous for both mother and baby, but also unpredictable in onset, progression and incurable except by termination of pregnancy. Having been seen and understood the complications of pre-eclampsia, there is a constant ongoing search for the better predictors and prognostic factors to assess the progress and severity of disease which profoundly affect the mother and fetus.

Changes in the hemostatic system are observed in normal and hypertensive patients. Because of a slow consumptive coagulapathy, thrombocytopenia is one of the commonest and early events in preeclampsia. Many studies have been conducted on the above fact because platelets are important in plugging the defect in the vessel wall and maintain continuity.

Here an attempt is made to identify the prognostic value of platelet count in pre-eclampsia.

AIMS AND OBJECTIVES

- To compare platelet count in normal pregnancy & Preeclampsia
- To study the relationship between platelet count & severity of preeclampsia

MATERIALS AND METHODS

This is a one and half years time bound prospective comparative study conducted in KIMSH & RC, Bangalore. After written informed consent, 200 women were included in the study. 100 Women with GA >28weeks with no other high risk factors were taken as controls. 100 Women diagnosed to be preeclamptics according to NHBPEP 2000 classification & GA >28weeks were taken as subjects/cases. Pregnant women with hemorrhagic diseases, thromboembolic episodes, epilepsy, hepatic/renal disease, use of long term steroids, aspirin, anticoagulants were excluded from the study.

After a detailed history and clinical examination, laboratory investigations were undertaken as per hospital protocol. Platelet counts were done every 4 weeks in controls and every week in subjects starting from 28weeks till delivery. Platelet count was estimated by ABX PENTRA Auto analyzer.

Comparison of platelet count between controls and cases was made & the relationship of platelet count to the severity of preeclampsia was studied.

Result analysis was done by X2 test using Microsoft excel and SPSS software version 11.

RESULTS

As shown in fig 1., in the cases group, 45% (45) were in the Mild pre eclampsia group, 47% (47) were in the severe pre eclampsia group and 8% (8) in the Eclampsia group when classified according to NHBPEP 2000 classification. Figure 2 shows that the maximum number of women were in the age group between 21-30 yrs(76.5%).Out of this, 80(52.28%) were controls, 34(22.2%) were mild PE, 33(21.6%) were severe PE & 6(3.9%) were eclamp-

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tics. 21(10.5%) women were <20yrs, 19(9.5%) were between 31-35 yrs & 7(3.5%) were > 35 yrs.

The mean age in the control group was 25.08 yrs, in the mild PE was 26.7 yrs, in severe PE was 26.6 yrs and 25.5 yrs in eclampsia group.

As the P value is not significant, age was not an important criterion in developing preeclampsia.

Out of 200 women, 104(52%) were primigravidae and 96(48%) were multi gravidae. 49% of preeclamptic women were primigravidae when compared to 51% of multigravidae.

As shown in Table 1., Most women, 25(55.55%) with mild PE were diagnosed to be hypertensive at term i.e., >37weeks, 22(46.5%) of severe preeclampsia patients were diagnosed as preeclamptics between 33-37weeks and 5(62.5%) of eclamptics had preeclampsia from 28-32weeks gestation. The mean age at diagnosis of preeclampsia in mild PE group was 35.8 wks, in severe PE was 32.2 wks and in eclampsia group was 29.6wks which suggests, as the gestational age at diagnosis of preeclampsia decreases the severity increases.

50 %(23) of the mild PE women had no symptoms as compared to only 8 in severe PE group. Most (13) of the women in severe PE and (4) eclampsia group had headache. Ascitis was seen in 5 of severe PE women. Blurring, oliguria, epigastric pain were more common in eclampsia group.

Current study shows that most of the women, 35(77.7%) of mild PE delivered after 37 weeks of gestation as compared to severe preeclampsia, where 75% delivered after 33 weeks and in eclampsia group 75% delivered before 33weeks. The mean age at delivery in mild PE is 38.25 weeks, in severe PE, 35.62 weeks and in eclampsia is 32 weeks of gestation. Also, proportionate increase in preterm delivery was seen as the severity of preeclampsia increased.

Complications during pregnancy increased as the severity of preeclampsia increased as shown in table 2.

Most of the women in control (64%) & in mild PE (71%) had neonates weighing >2.6kg as compared to severe PE group where most of the neonates (44.7%) & (42.6%) were below 1.5kg & between 1.6-2.5kg respectively. In the eclampsia group, maximum number of women (62.5%) had neonates weighing less than 1.5kg. The mean difference in all the groups is statistically significant, so the birth weight of the neonates in the preeclampsia group steadily decreased as the severity increased which can be explained by increasing iatrogenic preterm deliveries and growth restricted neonates with increasing severity.

Table 3. shows platelet counts in different groups of cases and controls. Thrombocytopenia was seen more in severe preeclampsia and eclampsia groups and was seen only in 4.4% of mild PE. All the control group women had platelet counts in the normal range.

When the mean platelet counts of women in the cases were compared to the controls, there was a statistically significant difference of platelet count between the two even though the counts were in the normal range PE group.This is shown in Table 4. From the above we can conclude that even though the mean platelet count in all the groups are within the normal range, they are significantly lower when compared to the controls, and this lowered platelet count is directly proportional to the severity of preeclampsia.

Discussion:

Thrombocytopenia is caused by the increased platelet consumption, yet the mechanism responsible for platelet activation remains unknown in preeclampsia. The severity of the disease process appears to correlate with reductions in platelet count. The question whether the platelet count falls as normal pregnancy progresses is controversial. It is unclear whether these peripheral changes are a cause or a consequence of the occlusive vascular lesions in the uteroplacental arteries. Attempts have been made to detect onset of preeclampsia by serial monitoring of platelet counts.

Preeclampsia is a multisystem disorder with lowering of platelet counts, one of the commonest and earliest features. This parameter may be used to assign the severity and prognosis of preeclampsia, which was the basis for the present study.

The mean platelet counts in different groups was compared with other studies conducted by Joshi Kale et al (2004)[1], Kulkarni & Sutaria(1983)[2], Agarwal & Buradkar(1978)[3], Giles & Ingles(1981) 4 & Dube et al (1975)5.

In all the studies including the present one, the mean platelet counts in the controls was >2.2 lacs/cmm, it also demonstrated a decreasing trend as the severity of pre eclampsia increased even though in most of the studies the mean platelet counts were in the normal range of 1.5-4 lacs/ cmm. Exception being in the study by Joshi Kale et al[1] & Kulkarni & Sutaria[2] where they had mean platelet counts < 1.5 & >1 lac/cmm in the severe PE & the eclampsia groups. None of the studies demonstrated thrombocytopenia (<1lac/cmm).Table 5.

Comparing the platelet counts in all the groups with the study by Joshi Kale et al shows comparable results in the controls& Mild PE (Table 6). In the severe PE group most patients in JK study showed platelet between 1-1.5 lacs/cmm & in eclampsia group between 1-1.5&<1lac/cmm distributed equally. In our study all the groups showed maximum number of women in the normal range of >1.5lacs/cmm. Thrombocytopenia was a feature of 5% of mild, 21.8% of severe and 39.3% of eclamptic women in the study by Joshi Kale et al[1]. In the present study, 12.8% of severe and 37.5% of eclamptic women and none in the mild preeclampsia group had thrombocytopenia.

Thrombocytopenia was mostly the feature of eclampsia.

Conclusion:

Thrombocytopenia is a known feature of preeclampsia which correlates with severity of the disease and thus can be a prognostic factor to better the outcome.

Table 1. Gestational age at diagnosis of hypertension in pregnancy

Gestational age (wks)	<28	28-32	33-37	>37	Mean GA(wks)	Total
Mild PE	-	9 (20%)	11 (24.4%)	25 (55.5%)	35.8	45 (100%)
Severe PE	1 (2.12)	17 (36.1%)	22 (46.8%)	7 (14.89%)	32.2	47 (100%)
Eclampsia	-	5 (62.5%)	2 (25%)	1 (12.5%)	29.6	8 (100%)

Table.2 Outcome of pregnancy in hypertensivecases.

Outcome	Mild PE	Severe PE	Eclampsia
IUD		12(25.7)	2(25)
FGR	5(11.1)	12(25.5)	2(25)
Abruption	3(6.7)	3(6.4)	-
HELLP	-	2(4.3)	-
MgSO4 use	-	3(6.4)	8(100)
Total	11	29	12

Table 3 Comparison of Platelet count in cases and controls

Platelet count (lacs/cmm)	< 1	1-1.5	1.5-2.5	>2.5
Controls	-	-	32(32)	68(68)
Mild PE	-	2(4.4)	20(44.4)	23(51.1)
Severe PE	6(12.76)	7(14.9)	24(51)	10(21.2)
Eclampsia	3(37.5)	1(25)	3(37.5)	1(25)

Table 4. Mean platelet count in cases and controls

Group	No. of patients	Mean platelet count(lacs/cmm)	P value(compared to the controls)
Mild PE	45	2.515+/-0.66	0.03(sig)
Severe PE	47	1.953+/-0.67	0.002(sig)
Eclampsia	8	1.7+/-0.79	0.001(sig)
Controls	100	2.840+/-0.63	

Table 5: Mean Platelet count (lacs/cmm) comparison in different series

Group	Present study	Joshi kale et al[1]	Kulkarni & Sutaria	Agarwal & Buradkar	Giles & Ingles	Dube et al
Controls	2.84	2.2	2.5	2.4	2.8	2.3
Mild PE	2.51	2	1.84	2.1	2.4	1.9
Severe PE	1.95	1.4	1.19	2.1	2.1	1.9
Eclampsia	1.71	1.3	1.18	1.6	1.5	1.8

Table 6: Comparison of platelet counts in different groups

Platelet counts (lacs/ cmm)	Controls (%)		Mild PE (%)		Severe PE (%)		Eclampsia (%)	
	JK	Pre	JK	Pre	JK	Pre	JK	Pre
>1.5	38(76)	100	30(75)	43(95.6)	12(37.5)	34(72.3)	6(21.4)	4(50)
1.0-1.5	12(24)	-	8(20)	2(4.4)	13(40.6)	7(14.9)	11(39.3)	1(25)
<1.0	-	-	2(5)	-	7(21.8)	6(12.8)	11(39.3)	3(37.5)
Total	50	100	50	45	32	47	28	8

(JK =Joshi Kale et al, Pre= Present study) (Numbers in brackets represent percentages)

Fig1.Classification of hypertension in preganacy

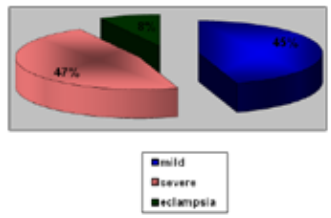


Fig 2. Age distribution

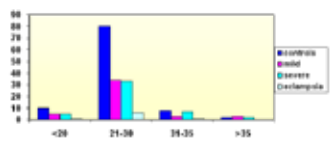
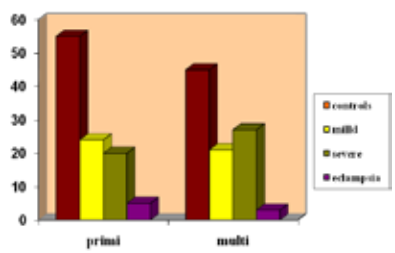


Fig3. Distribution of parity



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