Section | Gynaecology   Original | Article

A Prospective Study on Platelet Counts – A Prognostic Marker to Predict the Feto-Maternal Outcome in Pre-eclampsia and Eclampsia

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ABSTRACT_____

Background: Hypertensive disorders represent the most common medical complication of pregnancy affecting 7-15 % of all gestations and a leading cause of maternal and fetal morbidity and mortality especially in cases of pre-eclampsia and eclampsia. Out of all the haematological changes that occur in pre-eclampsia and eclampsia, thrombocytopenia is the most common haematological abnormality. Assessment of platelet count is a simple, cheap and relatively sensitive method to know the prognosis and to predict the feto-maternal outcome in pregnancy complicated by pre-eclampsia and eclampsia. *Methods:* This was a prospective study conducted in the Department of Obstetrics and Gynaecology, Pacific Medical College and Hospital, Udaipur over a period of 1 year which included 50 cases of pre-eclampsia and eclampsia and 50 cases of normotension in 3rd trimester of pregnancy. *Results:* Total 50 cases of pre-eclampsia and eclampsia were studied. Platelet count was significantly reduced with the severity of pre-eclampsia and eclampsia and it reflects feto-maternal outcome. *Conclusions:* Estimation of platelet count can be a reliable, rapid, easy and cheap method for early detection and assessment of severity at earlier gestational age which can help us to improve fetomaternal outcome.

Key words: Platelets, pre-eclampsia, eclampsia.

INTRODUCTION_____

Hypertension in pregnancy is defined as systolic blood pressure of 140 mm of Hg or higher and/or diastolic blood pressure of 90 mm of Hg or higher after 20 weeks of gestation recorded at least 4 to 6 hours apart but within a week period in a woman with previously normal blood pressure.[1,2] Hypertensive disorders represent the most common medical complication of pregnancy affecting 7-15% of all gestation and are leading cause of maternal and fetal morbidity and mortality especially in cases of pre-eclampsia and eclampsia.[3] Out of all the haematological changes that occur in pre-eclampsia and eclampsia, thrombocytopenia is the most common haematological abnormality found which affects 7-10% of the cases.[4]

There is platelet activation, aggregation, consumption and fall in platelet count with acceleration of the disease process and multi-system involvement. These changes are specific to hypertension in pregnancy as it does not occur in normal pregnancy.[5] The degree of thrombocytopenia increases with severity of disease and the incidence of thrombocytopenia depend on the severity and duration of preeclampsia. Overt thrombocytopenia is low platelet count < 1lacs/mm3.[6] Low platelet count is a part of clinical entity "HELLP Syndrome" i.e. Haemolysis, elevated liver enzymes and low platelet count. HELLP Syndrome increases maternal and perinatal morbidity and mortality.

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Serial platelet count measurements showing progressive fall in total platelet count is significant and predicts worsening of the disease prior to severe blood pressure rises.[7] In general, lower the platelet count, higher is the maternal and fetal morbidity and mortality. The platelet count returns to normal after 3-5 days of termination of pregnancy in 90% of cases.[6] Assessment of platelet count is a simple, cheap and relatively sensitive method to know the prognosis and to predict the feto-maternal outcome in pregnancy complicated by pre-eclampsia and eclampsia.

METHODS_____

This was a prospective study conducted in department of Obstetrics and Gynaecology, Pacific Medical College over a period of 1 year. Total 100 cases in 3rd trimester of pregnancy were enrolled in this study after taking written informed consent.

The study group included 50 women with pre-eclampsia and eclampsia while the control group included 50 women with similar demographic features and no associated complications. 50 study cases were further divided into mild and severe pre-eclampsia and eclampsia. Cases with systolic blood pressure between 140 to 159mm of Hg and diastolic blood pressure between 90 to 109 mm of Hg were categorized as mild pre-eclampsia (MPE). Cases with systolic blood pressure $\geq$ 160 mm Hg or diastolic blood pressure $\geq$ 110 mm Hg were categorized as severe pre-eclampsia (SPE). Cases with pre-eclampsia having convulsions that cannot be attributed to any other cause were categorized as eclampsia(E). Cases with pre-existing hypertension and associated co-morbid conditions such as haemolytic diseases, autoimmune diseases, neoplasia, hepatic or renal disorders, septicaemia, viral infections and on anticoagulant therapy were excluded from the study. The detailed history, important clinical findings, relevant investigations and appropriate management of cases were done accordingly and those were correlated with feto-maternal outcomes.

Statistical Analysis

In the present study, the data collected were analyzed using appropriate statistical methods. The fetal and maternal outcome was compared between control group women and in women with pre-eclampsia and eclampsia associated with thrombocytopenia.

RESULTS_____

The study was carried out in two groups each having 50 pregnant women selected from labour room as per selection criteria of control and study group. Study group was divided into mild pre-eclampsia (MPE), severe pre-eclampsia (SPE) and Eclampsia (E) depending on the severity of the hypertension with 19, 16 and 15 cases respectively.

Table 1 showing hypertensive disorder of pregnancy was more common in primigravida belonging to age group 21-30 years of lower socio-economic status and residing in rural area. Table 2 shows that incidence of low birth weight, pre-term and still birth increased with severity of disease with maximum incidence observed in eclampsia.

Table 3 shows the comparison of platelet count between control and study group. Table 4 showed Platelets Count among the Cases. Table 5 shows the magnitude of overt thrombocytopenia and maternal morbidity increasing with increase in severity of disease. HELLP syndrome, DIC and PPH were observed more in eclampsia cases while abruptio placenta observed more in severe pre-eclampsia.

DISCUSSION_____

Pre-eclampsia and eclampsia are major cause of maternal and perinatal morbidity and mortality in developing countries (8). In the present study, hypertensive disorders of pregnancy were divided into MPE (39%), SPE (36%) and eclampsia (25%) groups taking practically into account the magnitude of hypertension, proteinuria and presence or absence of convulsions.

In the present study, maximum number of cases with hypertensive disorders of pregnancy are in the age group of 21-30 years which is comparable with Vamsheedhar et al (2011) and Prakash et al (2006).[9,10] Primigravidae were more prone to hypertensive disorders of pregnancy (59%) and presented with more severe form of disease i.e. SPE (72.2%) and eclampsia (60%) as compared to multigravida which is comparable to Prakash et al (2006).[10] The incidence and severity of the disease is more common in lower socio-economic status which is comparable to Prakash et al (2006).[10] Unbooked cases and people residing in rural areas are mainly affected by hypertensive disorder of pregnancy because they are deprived of regular antenatal care. In SPE and eclampsia group there is an absolute decrease in platelet count when compared to the control group. This decrease is correlated with various studies as described below.

Our finding of decreasing platelet count with increasing severity of hypertensive disorders of pregnancy is consistent with Kulkarni et al(1983),[11] Joshi et al (2004),[12] Mohapatra et al(2007) and Ellora Devi et al (2012)[13,14] The incidence of low birth weight increases from control group (26%) to MPE (31.6%), SPE (62.5%), E (80%) due to iatrogenic prematurity and poor placental perfusion. The incidence of preterm birth increases from MPE (15.8%) to SPE (43.75%), E (80%) due to preterm pregnancy termination and placental insufficiency. The incidence of fetal death in our study was 12% which increases with severity of disease and correlates to the study of Kumar Majhi et al (2000).[15] The maternal complications seen in our study complicated by overt thrombocytopenia were HELLP syndrome, DIC, Abruptio placenta and PPH. There was increase in the incidence of the morbidities in the severe forms of hypertensive disorder of pregnancy accompanying overt thrombocytopenia which is correlated with Sibai et al (1986).[16]

Overt thrombocytopenia complicating pre-eclampsia and eclampsia causes worsening of feto-maternal outcome in terms of morbidity and mortality.

Table 1: Multiple responses upon knowledge level of respondents n(%)

	Control Group	Study Group			
		MPE	SPE	ECLAMPSIA	TOTAL
Total Cases	50	19	16	15	50
AGE					
≤20	12	02	5	5	12
21-30	31	11	9	7	27
>30	7	6	2	3	11
GRAVIDA					
G1	27 (54%)	10 (51.2%)	11 (72.2%)	8 (60%)	29
G2	15 (30%)	4 (23.2%)	3 (16.6%)	3 (28%)	10
≥G3	8 (16%)	5 (25.6%)	2 (11.2%)	4 (12%)	11
Socio-Economic Status					
Higher	18	4	2	3	9
Middle	24	8	4	4	16
Lower	8	7	10	8	25
ANC Checkup					
Booked	29	9	6	3	18
Unbooked	21	10	10	12	32
Rural-Urban Distribution					
Rural	30	13	13	11	37
Urban	20	6	3	4	13

Table 2: Fetal Outcome between the Control and Study Group

	Control (N=50)	Study Group (N=50)			
		MPE N=19	SPE N=16	Eclampsia N=15	Total
Live Birth	46	18	14	12	44
Still Birth	04	01	02	03	06
<1.5kg	3	1	02	02	5
1.5- 2.5kg	10	5	08	10	23
>2.5kg	37	13	06	3	22
Pre-Term	14	3	07	12	22
Term	36	16	09	03	28

Table 3: Comparison of Platelet count between control and study group

Platelet count (lacs /mm3)	Control (n =50)	MPE (n =19)	SPE (n =16)	Eclampsia (n =15)
Normal (> 1.5)	37 (74)	14(73.68%)	05(31.25%	03(20%)
Low (1- 1.5)	13(26)	04(21.05%)	07(43.75%)	06(40%)
Very low (<1.0)	—	01(5.26%)	04(25%)	06(40%)

Table 4: Platelets Count among the Cases

Group	Total Platelets Count Range (Lacs/Mm3)	Mean Platelet Count (Lacs/Mm3)	Standard Deviation
Control Group (50)	1.6-3.8	2.90	0.79
MPE	1.1-3.2	1.98	.49
SPE	0.9-1.9	1.63	.42
Eclampsia	0.8-1.4	1.12	.25

Table 5: Overt Thrombocytopenia Related Maternal Morbidity

Group	HELLP Syndrome	DIC	Abruptio Placenta	PPH
MPE	0	0	0	0
SPE	1	1	2	1
Eclampsia	3	4	1	2
Total	4	5	3	3

CONCLUSION

Hypertensive disorders are major cause of maternal and perinatal morbidity and mortality. Early diagnosis and treatment can reduce the severity of pregnancy induced hypertension. Thrombocytopenia is directly related with the severity of disease.

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