Study of Predictive and Prognostic Value of Platelets Count 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 gestation and 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 over period of 2 years which included 100 cases of pre-eclampsia and eclampsia and 100 cases of normotension in 3rd trimester of pregnancy. **Result:** Total 100 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. **Conclusion:** 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 prevent development of severe pre-eclampsia and eclampsia.

Keywords: 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 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 the acceleration of the disease process with multi-system involvement and specific for 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 of the disease process. Overt

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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. Serial platelet count showing progressive falling of total platelet count is significant and predict 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.

MATERIALS AND METHODS

This was a prospective study conducted in department of obstetrics and gynaecology, MKCG medical college Berhampur from September 2015 to august 2017. Total 200 cases in 3rd trimester of pregnancy was enrolled in this study after taking written informed consent.

The study group included 100 women with pre-eclampsia and eclampsia while the control group included 100 women with similar demographic features and no associated complications. 100 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 ≥ 160 mm Hg or diastolic blood pressure ≥ 110 mm Hg were categorized as severe pre-eclampsia (SPE). Cases with pre-eclampsia having convulsion that cannot be attributed to another cause categorized as eclampsia (E). Cases with pre-existing hypertension and associated co-morbid condition 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 finding, 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 analysed using appropriate statistical methods. The mean and standard deviations were completed. fetal and maternal outcome was compared between control group women and in women with pre-eclampsia and eclampsia associated with thrombocytopenia. Chi-square test of association was carried out to study the association of thrombocytopenia with the maternal and fetal outcome. The statistical analysis was carried out using the statistical packages for social sciences (SPSS-21).

RESULTS

The study was carried out in two groups each having 100 pregnant women selected from labour room, department of obstetrics and gynaecology, MKCG medical college, Berhampur as per selection criteria of control and study group. Study group divided into mild pre-eclampsia (MPE), severe pre-eclampsia (SPE) and Eclampsia (E) depending on the severity of the hypertension of pregnancy. Each group having 39, 36 and 25 cases.

[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 1: Socio-Demographic Profile.

	Control Group	Study Group			
		MPE	**SPE**	**ECLAMPSIA**	**TOTAL**
Total Cases	100	39	36	25	100
AGE					
≤20	23	02	13	06	21
21-30	63	22	18	14	54
>30	14	15	05	05	25
GRAVIDA					
G1	54 (54%)	20 (51.2%)	26 (72.2%)	15 (60%)	61
G2	30 (30%)	9 (23.2%)	6 (16.6%)	7 (28%)	22
≥G3	16 (16%)	10 (25.6%)	4 (11.2%)	3 (12%)	17
Socio-Economic Status					
Higher	35	7	6	3	16
Middle	48	17	8	8	33
Lower	17	15	22	14	51
Anc Checkup					
Booked	59	19	12	4	35
Unbooked	41	20	24	21	65
Rural-Urban Distribution					
Rural	60	27	28	20	75
Urban	40	12	08	05	25

Table 2: Statistics Of Platelets Count Among The Cases

Group	Total Platelets Count Range (Lacs/Mm3)	Mean Platelet Count (Lacs/Mm3)	Standard Deviation	'P' Value Compared With Control Group
Control Group (100)	1.4-3.6	2.80	0.79	
Mpe	1.3-3.4	1.94	0.49	> 0.05
Spe	0.9-2.1	1.43	0.42	<0.05
Eclampsia	0.8-1.7	1.17	0.25	<0.01

[Table 2] showing platelet count was adversely affected with the severity of the disease and maximum decrease was observed in eclampsia cases.

[Figure 1] showing incidence of overt thrombocytopenia was more in eclampsia (36%) and severe pre-eclampsia cases (16.6%).
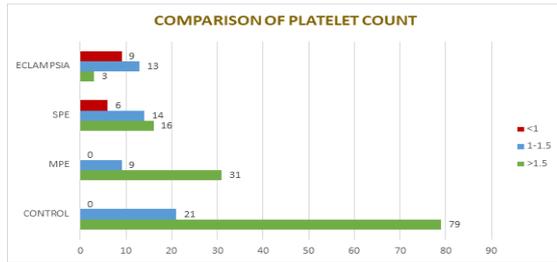
Figure 1: Comparison Of Platelet Count Between The Control And Study Group

[Figure 2] showing mode of delivery was caesarean section in 56% of study cases and 42% of control group and vaginal delivery in 44% of study group and 58% of control group. It concludes that caesarean rate increased with severity of disease and maximum caesarean rate observed in eclampsia (68%).
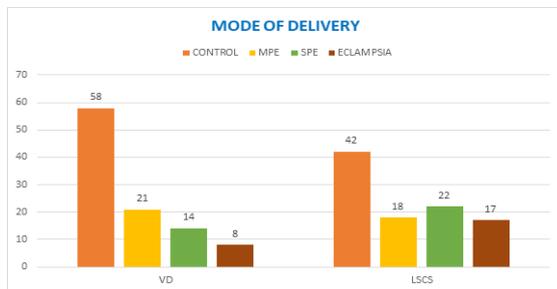
Figure 2: Mode of Delivery

[Table 3] shows incidence of low birth weight, pre-term and still birth increased with severity of disease with maximum incidence observed in eclampsia.

Table 3: Fetal Outcome Between The Control And Study Group

	Control (N=100)	Study Group (N=100)			
		Mpe	Spe	Eclampsia	Total
Live Birth	95	38	33	17	88
<1.5kg	2	1	2	2	5
1.5-2.5kg	19	8	25	12	45
>2.5kg	74	29	6	3	38
Still Birth	5	1	3	8	12
Pre-Term	15	6	13	14	33
Term	75	33	23	11	67

[Table 4] shows the magnitude of overt thrombocytopenia and maternal morbidity is increasing with increasing in severity of disease. HELLP syndrome, DIC and PPH observed more in eclampsia cases while abruptio placenta observed more in severe pre-eclampsia.

Table 4: 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

[Table 5] showing maternal death more common in eclampsia complicated with overt thrombocytopenia.

Table 5: Overt Thrombocytopenia Related Maternal Mortality

	Maternal Mortality
MPE (N=0)	0
SPE(N=6)	1
ECLAMPSIA(N=9)	5
TOTAL	6

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

DISCUSSION

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

In the present study, hypertensive disorders of pregnancy are maximum between the age group of 21-30 years which is comparable with Vamsheedhar et al (2011) and Prakash et al (2006).[9,10] Primigravida developed more hypertensive disorders of pregnancy (59%) and present with more severe form of disease i.e. SPE (72.2%) and eclampsia (60%) than 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 were deprived of getting the curative and preventive services of ANC.

In MPE group there is absolute decrease in platelet count but this is statistically not significant when compared to control group as P value > 0.05. in SPE and eclampsia group there are absolute decrease in platelet count when compare to control group and they are statistically significant and highly significant as P value < 0.05 and <0.01. This decrease is correlated with various studies as described below.

Group	Present Study	Joshi Et Al (2004)	Ellora Devi Et Al (2012)	Kulkarni Et Al (1983)	Mohapatra Et Al (2007)
Control	2.80	2.20	2.4	2.5	2.38
Mpe	1.94	2.00	1.82	1.84	2.23
Spe	1.43	1.40	1.42	1.19	1.82
Eclampsia	1.17	1.30	-	1.18	1.21

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Our finding of a trend of lowering of 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 (22.1%) to MPE (23.6%), SPE (81.8%), E (82.3%) due to iatrogenic prematurity and poor placental perfusion. The incidence of preterm birth increases from MPE (15.3%) to SPE (36.1%), E (56%) 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 increased 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]

CONCLUSION

Hypertensive disorders are major cause of maternal and perinatal morbidity and mortality. There occurrence can be reduced by early diagnosis and treatment. There is significant decrease in platelet count with the severity of disease. Thus, 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 prevent development of severe pre-eclampsia and eclampsia.

REFERENCES

1. American College of Obstetricians & Gynaecologists. Diagnosis and Management of Pre-Eclampsia and Eclampsia. Practice Bulletin No. 33. Washington, DC, January 2002.
2. NHBPEP (National High Blood Pressure Education Program) Working Group on High Blood Pressure. Report of The National High Blood Pressure Education Program Working Group in High Blood Pressure in Pregnancy. Am J Obstet Gynecol. 2000; S1-22.
3. James PR, Nelson-Piercy C. Management of Hypertension before, during, and after pregnancy. Heart. 2004; 90:1499-1504.
4. Baha M Sibai. Hypertension in pregnancy. In: S.G. Gabbe, J.R. Niebyl, J.L. Simpson editors. Obst. Normal and Problem of Pregnancies. 3rd Edn, New York: Churchill Livingstone; 1996; p. 935–991.
5. Walker JJ, Cameron AD, et al Am J Obstet Gynaecol 161: 676-679, 1989
6. Practical Guide to High Risk Pregnancy and Delivery, 3rd Edition by Fernando Arias, MD, PhD, Amarnath G Bhide, Arulkumaran S, KaizadDamania, Shirish N Daftary.
7. Giles C, Inglis TC. J Obstet gynaecol Ind 88: 1115-1159, 1981.
8. Vigil D, Gracia U. Pregnancy complicated by pre-eclampsia, eclampsia with HELLP syndrome P. International Journal of Gynaecology & Obstetrics 2001; 72: 17-23
9. Vamsheedhar Annam, Srinivas K, Yatnatti SK, Suresh DR. Evaluation of platelet indices and platelet counts and their significance in preeclampsia and eclampsia. Int J Biol Med Res 2011; 2:425-28.
10. Prakash J, Pandey LK, Singh AK, Kar B. Hypertension in pregnancy: Hospital based study. J Assoc Physicians India 2006; 54:273-8.
11. Kulkarni RD, Sutaria UD. Platelet counts in toxemia of pregnancy. J Obst Gynaecol Ind 1983; 33: 321–325.
12. Joshi kale, Vrunda, Sapre shaila. J Obstet Gynecol Ind Vol 54, No. 3; May/June 2004 page 235-236
13. Mohapatra S, Pradhan BB, Satpathy UK, Mohanty A, Pattnaik JR. Platelet estimation: Prognostic values in pregnancy induced hypertension. Indian J physiolpharmacol 2007; 51:160-64.
14. Dr Ellora Devi; Combination of Platelet & Uric Acid Estimation Can Predict Severity of Pih Better; Int J Pharm Bio Sci 2012 July; 3(3): (B) 1039 – 1045
15. Kumar Majhi, Sorathy Chakravorty, (2000) Calcutta; (Eclampsia present scenario in medical college, Calcutta) Obstet. Gynecol India, 2000; 50:128-32
16. Sibai MD, Mark M, Taslimi, Am J Obstet Gynecol Vol 155, issue 3, Sep 1986, Pg 501-507.