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PLATELET COUNT: A PROGNOSTIC INDICATOR IN PREECLAMPSIA AND ECLAMPSIA

Obstetrics & Gynaecology

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ABSTRACT

Introduction: Hypertensive disorders of pregnancy is one of the major complications of pregnancy. It forms the fatal triad along with the haemorrhage and infection that contributes greatly to fetal and maternal morbidity and mortality.Of the various parameters used, platelet count is the most simple and cost effective method for prediction of PIH(Pregnancy induced hypertension).This study soughts the importance of platelet count as the most consistent and reliable method in early detection of PIH cases.
Materials and methods: A prospective study was conducted on 164 cases and 70 controls over a period of 2 years. The bleeding time, clotting time, hemoglobin estimation and platelet count were performed.The patients were classified into mild preeclamptic, severe preeclamptic and eclamptic based on the clinical and haematological parameters.
Observations: The platelet count in severe preeclampsia and eclampsia was significantly lower than in mild pre eclampsia and controls. Thrombocytopenia was seen in total 35 cases of severe pre-eclampsia and eclampsia combined,out of which 30 (85.7%) had poor maternal outcome and 34 (97.1%) poor fetal outcome.
Conclusion: The frequency of thrombocytopenia is found to be directly related with the severity of disease. So routine test like platelet count can be used as a simple and cost effective tool to monitor the progression of preeclampsia and and plan preemptive management strategies that has been proven to have a crucial role in reducing the morbidity and mortality of both mother and fetus

KEYWORDS

Preeclampsia, Eclampsia, Maternal , Fetal, platelet count

INTRODUCTION:

Hypertensive disorders in pregnancy is one of the common medical complications of pregnancy. It affects 5-15% of all pregnancies contributing to maternal and perinatal morbidity and mortality.[1,2] Preeclampsia and eclampsia contributes to 3 death of a woman every 3 minutes worldwide.[3] There is increasing evidence that preeclampsia is a complex clinical syndrome involving all organ systems, with hypertension being one of the manifestations. Numerous pathophysiological changes such as renal, hemodynamic, coagulation disorders are present in preeclampsia, even before overt hypertension develops.[2]

Platelet activation is present during normal pregnancy as a part of global state of physiological hypercoagulability. It seems that this exacerbation of physiological platelet activation during pregnancy may be involved in pathogenesis of preeclampsia.[4]

Of all the haematological abnormalities that occur in PIH, thrombocytopenia is seen in 11% to 29% of patients.[5] These pregnancies are also associated with qualitative changes suggesting increased platelet production and destruction.[6]

The frequency and intensity of maternal thrombocytopenia varies and is dependent on the intensity of the disease process and duration of PIH syndrome.[7] Overt thrombocytopenia defined as platelet count <100,000/uL, indicates severe disease.In general,low platelet counts is associated with high maternal and fetal morbidity and mortality[8]

Preeclampsia is a dangerous condition for both mother and baby and is cured only by termination of pregnancy. It is observed that preeclamptic mother having coagulation indices in severely abnormal ranges were associated with more maternal and fetal jeopardy[9,10]

Therefore, this study is undertaken to assess the severity of pre-eclampsia, eclampsia and coagulopathy by estimation of platelet count, which is a simple,cost effective and easily available method, so as to prevent further complications and help in better outcomes of motherhood.

AIMS AND OBJECTIVES :

To correlate platelet count in patients with pre-eclampsia and eclampsia with maternal and fetal morbidity and mortality

MATERIALS AND METHODS :

A prospective study was conducted in the department of Pathology at Dr V.M. Government Medical College, Solapur from December 2012 to July 2014.

Selection Of Cases: Previously normotensive pregnant females of third trimester with signs and symptoms of preeclampsia and eclampsia in present pregnancy.Cases were categorized into mild preeclampsia, severe preeclampsia and eclampsia as per criteria given by William's Obstetrics.[11]

Selection Of Control: Control group constituted healthy normotensive pregnant women in third trimester of pregnancy.

The study group was divided into 4 groups.
I- Healthy normotensive pregnant controls- 70
II- Women with mild preeclampsia- 62
III- Women with severe preeclampsia-42
IV- Women with eclampsia-60.

Exclusion Criteria:- In this study, following patients were excluded:-
1. Chronic hypertension
2. Renal disorders
3. Twin pregnancy
4. Hydatidiform mole
5. Epilepsy.

Detailed history, important clinical findings and relevant investigations were noted as per the case proforma. The coagulation profile was carried out on the semiautomated TRINITY coagulometer. The haematological parameters were assessed on fully automated 3 part haematological analyser TRIVITRON Model-CELLENIUM-19.

RESULTS :

Total 164 cases and 70 controls were included in the study.In control group the maximum number of patients were seen in the age group of 20-24 years(yrs) and mean age was found to be 22.63yrs.Similarly mean age of patients with mild pre eclampsia was 22.4 yrs, severe pre-eclampsia was 22.8yrs and that with eclapmsia was 22.9yrs. Out of total 164 cases, 112 cases (68.3%) were primigravidae.

The mean gestational age in healthy pregnant control was 35.99±1.37wks(weaks). While the mean gestational age in mild preeclampsia, severe preeclampsia, and eclampsia was 35.17±2.43wks, 34.08±2.65wks and 32.61±2.99wks respectively.

Clinical data of cases shown in table 1 and mean Hemoglobin, platelet count and coagulation parameters in all groups enlisted in table 2.

Table 1- Clinical data of cases. (n = number of cases)

Parameters	Mild Preeclampsia (n=62)	Severe preeclampsia (n=42)	Eclampsia (n=60)
Systolic BP (mmHg) (Mean ± SD)	146.61±7.45	169.33±11.73	173.23±12.39
Diastolic BP (mmHg) (Mean ± SD	96.19±5.62	112.81±5.19	114.83±7.93
Edema Absent	09 (14.5%)	04 (9.5%)	4 (6.7%)
Present	53 (85.5%)	38 (90.5%)	56 (93.3%)
Pathological edema	03 (4.83%)	05 (11.90%)	12 (20%)
Proteinuria TRACE	16 (25.8%)	01 (2.4%)	0
+1	34 (54.8%)	08 (19%)	06 (10%)
+2	10 (16.2%)	12 (28.6%)	14 (23.3%)
+3	01 (1.6%)	12 (28.6%)	16 (26.7%)
+4	01 (1.6%)	09 (21.4%)	24 (40%)
Headache	19 (30.6%)	23 (54.8%)	44 (73.3%)
Blurring of vision	02 (3.2%)	11 (26.2%)	30 (50%)
Epigastric pain	00	02 (4.8%)	08 (13.3%)
Vomiting	02 (3.2%)	03 (7.1%)	20 (33.3%)
Oligouria	0	02 (4.8%)	08 (13.3%)

Table 2- Mean Hemoglobin, platelet count and coagulation parameters in all groups.

Tests	Normal pregnant control (n=70)	Mild preeclampsia (n=62)	Severe preeclampsia (n=42)	Eclampsia (n=60)
Hemoglobin (gm%)	9.85±1.30	9.72±1.41	8.69±1.81	10.3±1.35
Platelet count (lac/cumm)	2.38±0.55 (-)	2.25±0.61 (1.6%)	1.75±0.68↓** (21.4%)	1.44±0.58↓** (43.3%)
BT (min)	1.88±0.45 (-)	1.86±0.40 (-)	2.07±1.29 (4.76%)	2.24±1.45 (6.66%)
CT (min)	4.06±0.40 (-)	4.08±0.50 (-)	4.22±1.27 (4.76%)	4.30±1.52 (6.66%)
PT (sec)	13.27±0.81 (-)	13.3±0.86 (-)	13.30±2.65 (4.76%)	13.40±2.13 (6.66%)
APTT (sec)	31.61±4.06 (-)	31.87±3.80 (-)	36.44±13.15↑** (21.43%)	41.15±9.37 ↑** (23.33%)
TT (sec)	15.08±1.35 (-)	15.10±1.08 (-)	16.60±3.26↑** (21.43%)	18.60±3.11 ↑** (30%)

↓**- very significantly lower- P<0.01 ↑**-Very significantly higher- P<0.01 ( ) - indicates percentage of cases with abnormal values

It has been seen that prothrombin time was not significantly prolonged (P>0.05) in various severity of preeclampsia and eclampsia. The mean activated partial thromboplastin time and thrombin time in preeclampsia was significantly prolonged when compared with healthy controls. Similarly, in eclampsia the mean activated partial thromboplastin time and thrombin time was significantly prolonged as compared to controls.

Table 3 – Thrombocytopenia in cases

	Total no. of cases	1.0 to <1.5 lakh/ cumm	0.5 to <1.0 lakh/ cumm	<0.5 lakh/ cumm	Total cases with thrombocytopenia
Mild Preeclampsia	62	-	-	-	00 (0%)
Severe Preeclampsia	42	02	06	01	09 (21.4%)
Eclampsia	60	12	10	04	26 (43.3%)
Total	164	15	16	05	35 (21.3%)

Degree of thrombocytopenia in cases enlisted in table 3

The mean platelet count in mild preeclampsia, severe preeclampsia and eclampsia was 2.25±0.61lakh/cumm , 1.75±0.68lakh/cumm and 1.44±0.58lakh/cumm respectively. It has been seen that platelet count in severe preeclampsia (p<0.001) and eclampsia (p<0.001) was very significantly lower than that of normal pregnant control. Reduced platelet count was seen in 9 cases (21.4%) of severe preeclampsia and 26 cases (43.3%) of eclampsia.

Correlation of platelet count with maternal and fetal outcome in cases of severe preeclampsia and eclampsia shown in table 4 and 5

Table 4: Correlation of platelet count with maternal outcome in cases of severe preeclampsia and eclampsia combined.

Platelet count	No of cases	Unfavorable Maternal Outcome	Favorable maternal Outcome
Normal	67	07 (10.4%)	60 (89.6%)
Thrombocytopenia	35	30 (85.7%)	05 (14.3%)

Table 5:Correlation of platelet count with fetal outcome in cases of severe preeclampsia and eclampsia combined

Platelet count	No of cases	Unfavorable Fetal Outcome	Favorable Fetal Outcome
Normal	67	16 (23.9%)	51 (76.1%)
Thrombocytopenia	35	34 (97.1%)	01 (2.9%)

Out of 35 cases with thrombocytopenia, 30 (85.7%) had poor maternal outcome and 34(97.1%) had unfavourable fetal outcome,P<0.0001 which suggests that derangement is very significantly associated with maternal & fetal morbidity and mortality.

DISCUSSION:

Srivastava et al (1995) reported mean platelet count of 1.94 lakh/cumm in normal pregnant control, 1.79 lakh/cumm in mild preeclampsia,and significantly lower platelet count in severe preeclampsia and eclampsia i.e. 1.64 lakh/cumm and 1.52 lakh/cumm repectively[12]

Jambhulkar et al (2001) reported significantly lower platelet count in severe preeclampsia and in eclampsia.[13] S. Joshi et al (2004) reported platelet count 2.2 lakh/cumm in control group, 2.0 lakh/cumm in mild preeclampsia, 1.40 lakh/cumm in severe preeclampsia and 1.30 lakh/cumm in eclampsia[14]

Ellora Devi similarly reported mean platelet count of 2.44 lakh/cmm for controls , 1.82 lakh/cmm for mild preeclampsia and significantly lower count for severe pre eclampsia of 1.42 lakh/cmm.[15]

Similarly in this study, the platelet count was significantly lower in severe preeclampsia and eclampsia than that in normal healthy pregnant controls, but in mild preeclampsia it was not significantly lower than the healthy pregnant control.

A significant association between platelet activation and intrauterine growth retardation(IUGR) was found by Norris and group.[16] Higher rate of neonatal complications in cases with preeclampsia and thrombocytopenia was reported by Savita et al.[17]

Leduc et al reported that there is an association between thrombocytopenia and maternal complications and found that platelet nadir is the best predictor of maternal outcome.[8]

Our findings regarding the relation of the low platelet count and maternal and fetal outcome are consistent with all the studies mentioned above.

CONCLUSION:

Preeclampsia and eclampsia still remains a major problem in

developing countries.The trend of lowering of platelet count with increasing severity of pregnancy induced hypertension help us understand that simple and routine tests like CBC and platelet count are highly helpful in suspecting a derangement in the coagulation status early in the course of the disease and plan preemptive management strategies.

As platelet nadir is the predictor of maternal and fetal outcome,early detection combined with the institution of prompt treatment has a definite role in reducing the morbidity and mortality of both mother and fetus.

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