COMPARATIVE STUDY OF PLATELET COUNT IN NORMAL PREGNANT WOMAN AND IN PREGNANCY-INDUCED HYPERTENSION

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ABSTRACT

BACKGROUND

Pregnancy-induced hypertension is one of the most common and potential life-threatening complications of pregnancy. The aim of this study is to investigate the difference in platelet count in normal pregnant woman and pregnancy-induced hypertension patient.

MATERIALS AND METHODS

It is a case control study. This study includes 100 cases in which there are two groups. First group has 50 normal pregnant women as control and second group has 50 cases with pregnancy-induced hypertension, in which the subgroup has 40 cases with mild pregnancy-induced hypertension and 10 cases with severe pregnancy-induced hypertension. Study was conducted in the Department of Physiology in collaboration with Department of Obstetrics and Gynaecology in Kamala Raja Hospital (Gwalior). Patients were studied, and platelet count was done in all cases in third trimester of pregnancy from April 2005 to Oct. 2006.

RESULTS

In this study, there is an inverse relationship between the severity of PIH and platelet count. Mean platelet count was found to be less in patients with higher blood pressure.

CONCLUSION

Our study and result showed that assay of platelet can be considered as one of the prognostic tools in management of hypertensive disorders of pregnancy.

KEY WORDS

Platelet Count, Pregnancy, Hypertension.

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BACKGROUND

Pregnancy-Induced Hypertension (PIH) is one of the most common and potentially life-threatening complication of pregnancy. It affects 5 - 8% of all pregnancies and is one of the leading causes of high morbidity for both mother and foetus, especially in developing countries.⁽¹⁾ Thrombocytopenia can be due to idiopathic thrombocytopenic purpura (ITP), which is caused mostly because of the formation of autoimmune antibodies, Letsky and Greaves.⁽²⁾ Pregnancy-induced hypertension (blood pressure greater than 140/90) occurs before or after 20 weeks of gestation with no proteinuria. The clinical manifestations of maternal preeclampsia are hypertension and proteinuria, with or without coexisting systemic abnormalities involving the kidneys, liver or blood. HELLP syndrome is a severe form of preeclampsia and involves haemolytic anaemia, elevated liver function tests (LFTs) and low platelet count.⁽³⁾ The aim of this study was to investigate the effect of platelet count in pregnancy-induced hypertension.

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Aims and Objectives

To investigate the difference in platelet count in normal pregnant woman and pregnancy-induced hypertension patient.

MATERIALS AND METHODS

Study Area

It is a case control study. Study was conducted in the Department of Physiology in collaboration with Obstetrics and Gynaecology in Kamala Raja Hospital (Gwalior) were studied and platelet count was done in all cases in third trimester of pregnancy from April 2005 to Oct. 2006. Two millilitres of blood sample were drawn aseptically using the S-Monovette vacutainer blood collection system (Sarstedt, Numbrecht, Germany) from the median antecubital vein of all the subjects and control participants into EDTA-anticoagulated tubes. The blood was diluted with the diluent (1%) ammonium oxalate by 1 in 20 dilutions (0.02 mL of blood and 0.38 mL of diluent). Platelets were counted using improved Neubauer ruled counting chamber (Hawksley, UK) and the number of platelets per litre of blood was calculated using the first principle.

Sample Size

Present study was carried out in 100 cases, which was conducted on two groups of pregnant women-

Group 1- Control: 50 normal pregnant women.

Group 2- 50 pregnant women (PIH), which was further divided into subgroups of mild PIH and severe PIH.

- a. Mild PIH- Is defined by hypertension (blood pressure greater than 140 mmHg systolic or 90 mmHg diastolic) associated with proteinuria > 0.3 g/L in a 24-hour urine collection of 1+ dipstick or greater in random urine collection after 20 weeks of gestation in a previously normotensive woman.⁽⁴⁾
- b. Severe PIH- This condition was categorised if systolic blood pressure was > 160 mmHg and diastolic blood pressure was > 110 mmHg.⁽⁵⁾

Inclusion Criteria

All consenting adult (> 18 years) pregnant women who were confirmed to have pregnancy-induced hypertension by an obstetrician constituted the subjects for these subjects.

Exclusion Criteria

Non-consenting, non-adult pregnant women with other pregnancy-related complications were excluded.

Statistical Analysis

The results were analysed statistically to draw comparison between the groups. The statistical data was processed using Microsoft Excel to draw the values of significance for Group II and its subgroups. Tests of significance applied were 'Z' test for statistical analysis to suggest the relation between the observed abnormal value of chosen laboratory tests in the study with hypertensive disorders of pregnancy and its importance in antenatal care.

RESULTS

Sl. No.	Group	No. of Case
1	Normal Pregnant	50
2	Pregnancy with PIH	50

Table 1. Distribution of Cases

Sl. No.	Group	No. of Case	Percentage
1.	Mild PIH	40	80%
2.	Severe PIH	10	20%

Table 2. No. and Percentage of Cases of Pregnancy-Induced Hypertension

Sl. No.	Platelet Count	Pregnant Control	Mild PIH	Severe PIH
1.	Normal (1.5 - 4 lac/cumm)	48(96%)	35(87.5%)	1(10%)
2.	Low (1 - 1.5 lac/cumm)	2(4%)	5(12.5%)	9(90%)
3.	Very low (<1 lac/cumm)	0(0%)	0(0%)	0(0%)

Table 3. Compression of No. and Percentage of Cases with Normal, Low, Very Low, Platelet Count in Control and Study Group

Sl. No.	Platelet Count	Normal Pregnant	Mild PIH	Severe PIH
1	Platelet count (lacs/cumm)	2.1 lacs/cumm	1.9 lacs/cumm	1.4 lacs/cumm

Table 4. Comparison of Mean Platelet Count between Control, Mild PIH and Severe PIH

Normotensive		Mild PIH	
Sample Size N ₁	=50	Sample size N ₂	=40
Mean platelet count (lacs/cumm)	2.1 lacs/cumm	Mean platelet count (lacs/cumm)	1.9 lacs/cumm
SD	.445	SD	.331

1. Normotensive versus Mild PIH in Platelet Count

SE (d)= .081 by applying Z-test > 2, hence it is significant.

Normotensive		Mild PIH	
Sample Size N ₁	= 50	Sample Size N ₂	= 10
Mean platelet count (lacs/cumm)	2.1 lacs/cumm	Mean platelet count (lacs/cumm)	1.4 lacs/cumm
SD	.445	SD	.365

2. Normotensive versus Severe PIH in Platelet Count

SE (d)= .132 by applying Z-test > 2, hence it is significant.

Mild PIH		Severe PIH	
Sample Size N ₁	= 40	Sample Size N ₂	= 10
Mean platelet count (lacs/cumm)	1.9 lacs/cumm	Mean platelet count (lacs/cumm)	1.4 lacs/cumm
SD	.331	SD	.365

3. Mild PIH versus Severe PIH in Platelet Count

SE (d)= .125 by applying Z-test > 2, hence it is significant.

DISCUSSION

In this study we investigated the platelet count of 100 pregnant women, in which we have 50 cases as normal pregnant and 50 with pregnancy-induced hypertension. We observed a significantly lower platelet count among pregnant women with PIH compared to controls. There seems a significant relationship between low platelet count and PIH. Our finding is consistent with findings from previous study,⁽⁶⁾ which observed a low platelet count among PIH patients.

Redman et al reported decreased platelet count in women who developed pre-eclampsia and stated that increased platelet consumption is an early feature of this disorder.⁽⁷⁾

Galton et al claimed that the severity of thrombocytopenia correlates with severity of hypertension.⁽⁸⁾

Romero et al reported that women with pre-eclampsia and thrombocytopenia have higher incidence of maternal and neonatal complications.⁽⁹⁾

In the present study, the mean platelet count falls with increased severity of disease and the count was found to be less in patients with higher blood pressure.

Lower the platelet count, greater the maternal and foetal morbidity and mortality. (Verhaeghe and colleague, 1991 Ledue and co-worker, 1992).

Studies	Normal Pregnant	Mild PIH	Severe PIH
(Count in lacs/cumm of Blood)			
⁽¹⁰⁾ Dube and Associates (1975)	2.3	1.9	1.9
⁽¹¹⁾ Agrawal and Buradkar (1978)	2.4	2.1	2.1
⁽¹²⁾ Inglis (1982)	2.6	2.4	2.1
⁽¹³⁾ Kulkarni and Suteria (1983)	2.5	1.84	1.9
⁽¹⁴⁾ Katz (1990)	2.1	1.2	1.2
⁽⁷⁾ Our Study	2.1	1.9	1.4
Comparison of Mean Platelet Count in different Studies			

CONCLUSION

The platelet count has an association at prediction of increasing grade of PIH. There is an inverse relationship between the severity of PIH and platelet count.

There is definite statistical difference in values of platelet count, platelet count in PIH groups when compared with normotensive pregnant woman. Therefore, these tests may be considered as screening tests to be routinely performed in antenatal workup of women with PIH. Hence, platelet count can be used as a prognostic indicator in pregnancy-induced hypertension.

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