

# Thrombocytopenia in Pregnancy Induced Hypertension

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## Abstract

**Introduction:** Hypertension is a common clinical complication during pregnancy. About 18% of foetal deaths are associated with hypertensive disorders. Out of all the haematological changes that occur in Pregnancy Induced Hypertension (PIH), thrombocytopenia is the most common haematological abnormality found.

**Material & Method:** Study subjects include 70 women with diagnosed PIH (case) and 70 normotensive pregnant women (control). Platelet count was done.

**Result:** In PIH cases the low platelet count was seen as compared to normotensive pregnant women. In this study between mean blood pressure & platelet count no correlation was found in normotensive pregnant women but significant negative correlation was found in PIH.

**Conclusion:** We found significant negative correlation between mean blood pressure & platelet count in PIH.

**Keywords:** PIH, Mean Blood Pressure, Platelet Count

## Introduction

Hypertension is a common clinical complication during pregnancy. The most widely used term at present for hypertensive disorder is Pregnancy induced hypertension (PIH)<sup>1</sup>. PIH is defined as hypertension that occurs in pregnancy for the first time after 20 weeks of gestation and disappears following delivery<sup>2</sup>. It affects approximately 6-8 % of all pregnancies, most often the primigravida<sup>3</sup>. About 18% of foetal deaths are associated with hypertensive disorders<sup>4</sup>. Out of all the haematological changes that occur in PIH, thrombocytopenia is the most common haematological abnormality found<sup>2</sup>. Other tests fibronectin level, decrease antithrombin III level,

decrease in  $\alpha 2$  antitrypsin, increase in sFlt-1 (soluble Fms – like tyrosine kinase – 1) concentration, decrease in circulating free placental growth factor (PlGF) and vascular endothelial growth factor (VEGF) are though more sensitive but expensive, time consuming, require well equipped laboratory and not suitable for routine purpose<sup>2</sup>. Blood platelets are essential parameters used in assessing thrombosis<sup>5</sup>. This suggests the need for early intervention in hypertensive patients for appropriate management so as to avoid complications associated with coagulation and thrombosis. As such the present study has been undertaken to evaluate the relationship between platelet count in normal pregnancy (control) and PIH.

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## Material & Method

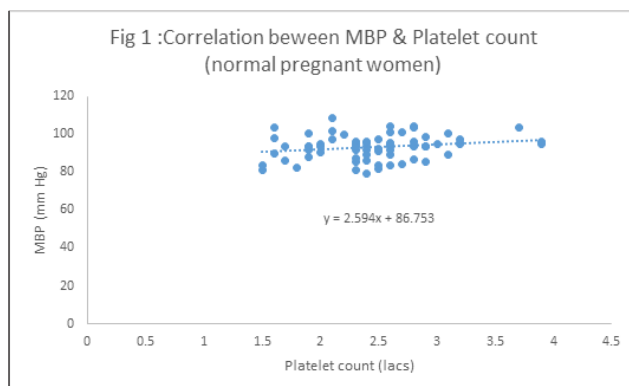
The study was carried out in department of Physiology in collaboration with the department of Obstetrics and Gynecology Rohilkhand Medical College & Hospital (RMCH), Bareilly, U.P., India.

The patient with pregnancy of more than 20 weeks reporting to Department of Obstetrics & Gynecology, OPD between the period from 1<sup>st</sup> Jan. 2014 to 31<sup>st</sup> Dec. 2014 were included in this study. Study subjects includes 70 women with diagnosed PIH and 70 normotensive pregnant women. Blood pressure was measured by sphygmomanometry. Patient of PIH have systolic blood pressure of at least 140 mmHg and/or diastolic blood pressure (DBP) of at least 90 mmHg. Mean Blood Pressure (MBP) of both normotensive and hypertensive pregnant women were calculated by using formula  $DBP + 1/3 \text{Pulse Pressure}$ .

Two ml of venous blood were obtained after 10-12 hours of fasting in EDTA vial. Platelet count was conducted by Bechman counter Hematology analyzer model LH 750 in the central research laboratory of RMCH, Bareilly. Statistical analysis was done using SPSS(version17) for the determination of the correlation between MBP and platelet count of PIH and normal pregnancy. Scatterogram with regression line were drawn on Microsoft Excel 2010.

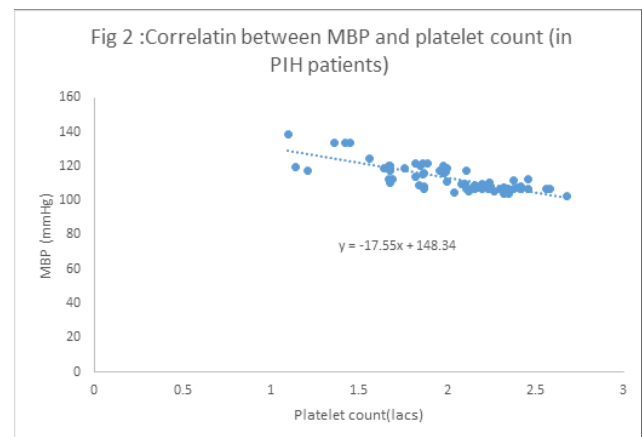
## Result

In PIH the mean value of platelet count was  $2.032 \pm 0.354 \times 10^5/\text{cumm}$  (mean  $\pm$  standard deviation) and in normal pregnancy the value of platelet count was  $2.46 \pm 0.524 \times 10^5/\text{cumm}$ . In this study no correlation ( $r = 0.03$ ) between MBP and platelet count could be seen in control patient with normal pregnancy (fig 1). Where as in hypertensive patient with pregnancy (fig 2) a significant negative correlation ( $r = -0.74$ ) was observed between the variables correlated. This correlation is governed by the equation  $y = -17.55x + 148.34$ .



## Discussion

In this study we attempted to establish correlation between MBP and platelet count in pregnant women with or without hypertension. In control patient no



significant correlation was seen where as a significant negative correlation was seen in PIH cases. In present study we have observed a significantly decreased platelet count in PIH patients as compared to control pregnant patients. Negative correlation between MBP and platelet count indicates involvement of one or more number of factors in the causation of decrease platelet count and MBP. Though exact cause of hypertension in pregnant women has not been fully understood, several factors like fetal hypoxia due to defective fetoplacental vasculature and resultant imbalance in release and metabolism of prostaglandins, endothelin, enhanced lipid peroxidation and nitric oxide by placental and extraplacental tissues have been implicated as the cause of the hypertension in this subset of patients.

Conflicting results have been reported regarding plate count in hypertensive patients of both sexes. Nwovu *et.al.*<sup>6</sup> have observed a significant increase in platelet count in hypertensive patient, whereas Benjamin *et.al.*<sup>5</sup> have reported a significant decrease in platelet count in hypertensive pregnant patients and Nadar *et.al.*<sup>7</sup> have found no change in platelet count in hypertensive patients of both sexes. S. Mohapatra *et.al.*<sup>2</sup> observed an inverse relationship between the severity of PIH and platelet numbers. Similar results have been found in our study as well wherein we also have established an inverse relation between blood pressure and platelet counts. The decrease in platelet count in this study and other studies has been attributed to endothelial damage and aggregation of platelets at these sites in cases of PIH with or without the features of preeclampsia. Magann EF *et.al.*<sup>8</sup> have suggested that the platelet count as the best tests for the determination of severity of PIH and progression/recovery of HELLP (Hemolysis, Elevated Liver Enzyme, Low Platelet Count) syndrome.

## Conclusion

In present study we have observed a significantly decreased platelet count in PIH patients as compared to control pregnant patients. Whereas in control patient no correlation was seen, a significant negative correlation was seen between MBP and platelet count in PIH cases. The negative correlation indicates involvement of one or more number of factors reported the literature in the causation of decrease platelet count and MBP.

**Conflict of Interest:** Nil

**Funding Agencies:** Self

**Ethical Clearance:** Obtained

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