



## What Happens To Platelet Indices in Normal Pregnancies and Pregnancy Induced Hypertension?

### KEYWORDS

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**ABSTRACT** *Background:* Preeclampsia (PE) is an obstetric disorder with high morbidity and mortality rates but without clear pathogeny. The dysfunction of the blood coagulation-fibrinolysis system is a salient characteristic of PE that varies in severity, and necessitates different treatments. Therefore, it is necessary to find suitable predictors for the onset and severity of PE.

*Aim:* To evaluate platelet Indices in normal pregnancies and pregnancy induced hypertension

*Method:* The total of 100 pregnant patients with period of gestation 20 week to 40 week were studied. 50 patients with normotensive pregnancy, 50 patients with hypertension in pregnancy of different severity. Patients were followed at (20-24 week) visit 1, (24-28 week) visit 2, (28-32 week) visit 3, (32-36 week) visit 4, (36week- termination of pregnancy) visit 5.

*Results:* In the control group there were no significant change in platelet indices whereas in test group patients, changes in platelet indices values were significant (<.05).

*Conclusion:* platelet indices provide a simple, cheap and effective tool for the obstetrician to monitor pregnancy induced hypertension. Any significant deviation can forewarn impending maternal or fetal morbidity.

*Abbreviations PIH:* Pregnancy-induced Hypertension; PL: Platelets count; MPV: Mean Platelets Volume; PDW : Platelet Distribution Width.

### Introduction

Pregnancy induced hypertension is defined as hypertension that occurs in pregnancy for the first time after 20 weeks of gestation and disappears following delivery. PIH still remains the disease of theories as its cause is not fully established. There is gradual rise in the incidence of pregnancy induced hypertension over the last few decades.<sup>1</sup>

Preeclampsia (PE) is among the commonest medical disorder during pregnancy it complicates about 5 to 10% of pregnancies and continues to be a major cause of maternal and perinatal morbidity and mortality.<sup>2</sup> It is a multisystem disease of unknown etiology and there is a constant search for better prognostic factors to predict the progression and severity of disease<sup>3</sup> so as to prevent complications like placental abruption, HELLP syndrome, eclampsia etc. In pregnancy induced hypertension and pre-eclampsia, researches have shown changes in platelet numbers, platelet survival, and mean platelet volume, which have been interpreted as evidence of increased platelet consumption. Studies have suggested that platelet count (PC) falls early in the disease with platelet consumption, probably due to low-grade intravascular coagulation playing an active role in the pathophysiology of this disorder.<sup>4</sup>

### Material and Methods

The prospective Study was conducted in the department of obstetrics and gynaecology, kasturba hospital, delhi in 2013-2015.

The study was done in two groups of patients: CASE and CONTROL groups.

The control group consisted of 50 pregnant patients with period of gestation 20 week to 40 week. The study group consisted of 50 patients with period of gestation 20 week

to 40 week with hypertension in pregnancy of different severity. Patients were followed at (20-24 week) visit 1, (24-28 week) visit 2, (28-32 week) visit 3, (32-36 week) visit 4, (36week- termination of pregnancy) visit 5.

### Exclusion Criteria

Any significant history of haemorrhagic disorder, diabetes mellitus, cardiovascular diseases.

History of drug intake which can affect the platelet count and bone marrow.

Patients with history of renal disorder, hepatic disorder, thyroid disorder or any other known cause of hypertension prior to pregnancy.

Studied Platelet indices: 1- platelet count, 2- mean platelet volume, 3- platelet distribution width

### Sample Handling:

An EDTA venous blood was analyzed within 2-6 hours to minimize the alteration in platelets size for complete blood count. Concerning platelet count, mean platelet volume (MPV) and platelet distribution width (PDW) for patients and control were performed by fully automated hematology analyzer (SYSMEX XT 2000i analyser.). On the other hand the proteinuria was detected by urine strips (self-stick).

### Results

G1, control consisted of 50 women their mean age was  $24.96 \pm 3.22$ . G2, cases included fifty women with PIH and preeclampsia with mean age  $25.76 \pm 3.04$  yrs. The PIH and preeclampsia group had significantly decreased platelets when compared to the control group. Marked decline in platelets was observed in pre-eclampsia and PIH groups

and this decline was directly proportional to the severity of the hypertension (fig1). The MPV, PDW values were elevated proportionally with the severity of pre-eclampsia when compared to the control group (fig 2&3).

Fig1

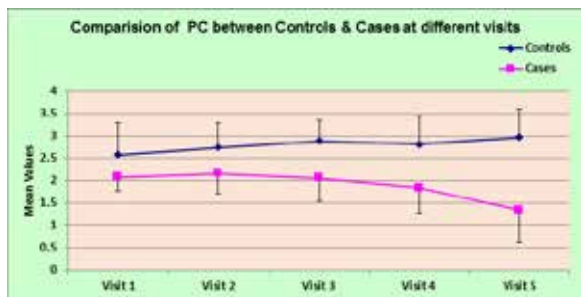


Fig2

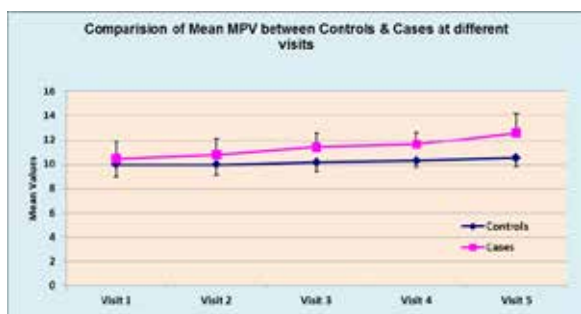
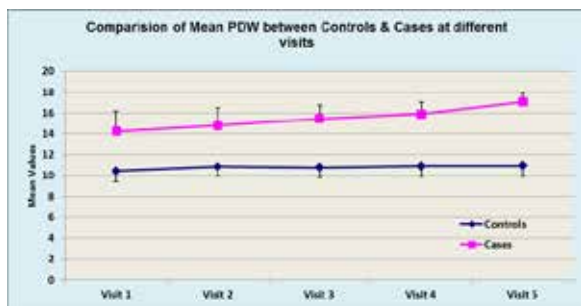


Fig3



**Discussion**

In most of patients, the clinical appearance is mild, presenting only with small increase in blood pressure or protein in the urine. In this study an attempt has been made to assess the role of platelet indices in normotensive pregnant women and PIH women. The Severity of PIH and decreasing of platelets was observed to be closely correlated which indicates that thrombocytopenia is directly proportional to the severity of PIH. The platelet values in our series were: 2.97 Lcumm , 1.33 Lcumm in normotensive pregnant women and PIH groups respectively (Table 1). When the values of platelet number estimation were compared between the normotensive pregnant women and PIH a significant decrease in platelet number was observed as the mean blood pressure increased. Referring to platelet count, significant reduction was observed in a study conducted in India, by Dadhich et al.5 and a study done by Annam et al.6 which were similar to our results. There is a gradual increase in MPV from normotensive pregnant women to PIH women (Table 2). It was observed that increase in MPV in PE patients had a direct relationship with increase in severity of PIH. There was an increase in PDW

from normotensive pregnant women to mild PIH (Table 3).

**Table 1**

Platelet count (Lcumm)	Dadhich et al <sup>5</sup> 2012	S.W. Yang et al <sup>7</sup> 2014	Vijaya C et al <sup>8</sup> 2014	Wael et al <sup>9</sup> 2014	Present study
Control group	2.31	2.28	2.18	2.52	2.97
Case group	1.75	1.80	1.55	1.34	1.33

**Table 2**

Mean Platelet volume (fl)	Dadhich et al <sup>5</sup> 2012	S.W. Yang et al <sup>7</sup> 2014	Vijaya C et al <sup>8</sup> 2014	Wael et al <sup>9</sup> 2014	Present study
Control group	10.66	10.0	8.64	8.52	10.55
Case group	15.65	11.2	10.38	11.29	12.60

**Table 3**

Platelet distribution width (fl)	Dadhich et al <sup>5</sup> 2012	S.W. Yang et al <sup>7</sup> 2014	Vijaya C et al <sup>8</sup> 2014	Wael et al <sup>9</sup> 2014	Present study
Control group	16.70	11.6	11.08	11.09	10.90
Case group	21.80	14.6	15.50	17.39	17.08

**Conclusion**

The study concluded that platelet indices provide a simple, cheap and effective tool for the obstetrician to monitor pregnancy induced hypertension. Any significant deviation can forewarn impending maternal or fetal morbidity. Hence close surveillance of patient along with platelet indices parameters would allow a precise diagnosis and a timely pregnancy intervention.

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**DECLARATION**

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Conflict of interest: None declared

Ethical approval: was taken from ethical committee

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