



Original Research Article

Platelet Count in Pregnancy Induced Hypertension and Other Pregnancy Related Clinical Conditions

Subbalakshmi NK^{1*}, Geraldine Monteiro^{2**}, Anupma N^{1*}, Bhagyalakshmi K^{3*}, Sheila R Pai^{3*}

¹Associate Professor, ²Tutor, ³Professor,

*Department of Physiology, Kasturba Medical College, Mangalore, Manipal University, Mangalore, Karnataka.

**Department of Physiology, Bangalore Medical College, Bangalore, Karnataka, India

Corresponding Author: Subbalakshmi NK

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ABSTRACT

Introduction and objective: Low platelet count is observed in several conditions including pregnancy. Whether thrombocytopenia is associated with any specific pregnancy related clinical conditions is not clear. This study estimated the frequency of thrombocytopenia in major pregnancy related clinical conditions.

Materials and Methods: 200 singleton mothers in 20th week of gestational period were studied. Based on the clinical diagnosis they were divided into 6 groups: Group A: with Pregnancy induced hypertension (n= 84); Group B: with anemia (n = 42); Group C: with Foetal distress syndrome (n = 52); Group D: with oligohydramnios (n = 76); Group E: with polyhydramnios (n = 15); Group F: with gestational diabetes (n = 88). In each subgroup frequency of subjects with and without thrombocytopenia was estimated and compared. Statistical analysis was done using Chi-square test. p<0.05 was considered significant.

Result: In group A, percentage of subjects with thrombocytopenia was higher compared to subjects with normal platelet count (70.23 % vs. 29.76, p < 0.001). In groups B, C, D, E and F there was no significant difference in subjects with and without thrombocytopenia.

Conclusion: Thrombocytopenia is mainly associated with pregnancy induced hypertension.

Key words: Pregnancy related clinical conditions; thrombocytopenia; pregnancy induced hypertension

INTRODUCTION

Platelets are blood cells whose function is to stop bleeding at the site of interrupted endothelium.^[1] Low platelet concentration is due to either decreased production or increased destruction of them.^[2] Numerous observations have been made on the total thrombocyte count in health and in disease. Some of these studies have observed thrombocytopenia in 6 to 15% of

pregnant women at the end of pregnancy.^[3] Thrombocytopenia is second only to anemia observed as the most common hematological abnormality during pregnancy.^[4] However, whether thrombocytopenia is associated with any specific pregnancy related clinical conditions is not clear. Therefore this study investigated the frequency of thrombocytopenia in

commonly observed pregnancy related clinical conditions.

MATERIALS AND METHODS

The present study was a retrospective, descriptive type done in singleton mothers. This study was done after obtaining permission from ethical committee of the institution and consent from the study participants.

This study included 200 singleton mothers in 20th week of gestational period, in whom platelet count and other relevant medical reports were available until they were discharged from the hospital after delivery. They were grouped into 6 subgroups based on the different pregnancy related clinical conditions as follows:

Group A: with pregnancy induced hypertension (n = 84); Group B: with anemia (n = 42); Group C: with Foetal distress syndrome (n = 52); Group D: with oligohydramnios (n = 76); Group E: with polyhydramnios (n = 15); Group F: with gestational diabetes (n = 88).

Frequency of singleton mothers with and without thrombocytopenia was estimated in every subgroup of study subjects.

Diagnosis of thrombocytopenia

Thrombocytopenia was defined as a platelet count of less than 150,000/L.

Inclusion criteria: Age >18 years but < 30 years; no obesity; pregnancy of less than 16 weeks gestation; singleton pregnancy.

Exclusion criteria: Known major fetal abnormality noted on 12 week ultrasound examination; history of previous stillbirth, preterm delivery considered being likely for either maternal disease or fetal conditions.

Study procedures

In all the subjects, height and weight were measured and body mass index was calculated using the formula weight in kilogram divided by height in meters squared. Systolic and diastolic blood pressure was measured in sitting position.

Data on platelet count and random blood sugar were collected from the freshly done lab investigation reports. Relevant data on clinical conditions associated with pregnancy was noted down from medical records of these subjects.

Statistical analysis: AVOVA was used to compare the baseline characteristics of singleton mothers among 6 subgroups of study subjects. When data was not uniformly distributed non-parametric method namely Kruskal-Wallis test with post -test was used. Chi-square test was used to compare the frequency of subjects with thrombocytopenia in different clinical conditions. $P < 0.05$ was taken as significant.

RESULT

The data on baseline characteristics of singleton mothers observed with 6 different clinical conditions is presented in table 1. Data is presented as mean \pm SD. The mean age of study in six subgroups was comparable ($F = 0.8576$, $p = 0.509$; table 1). Body mass index did not differ significantly among the study subjects with different pregnancy related complications ($F = 1.155$, $p = 0.331$, table 1). Systolic blood pressure was not comparable among the 6 subgroups ($KW = 38.366$, $p < 0.0001$). Mean systolic blood pressure of group A was significantly higher compared to group B, group D and group F ($p < 0.001$, table 1). Systolic blood pressure did not differ significantly among other subgroups of study subjects. Diastolic blood pressure was not comparable among the 6 subgroups ($KW = 34.593$; $p < 0.0001$). Diastolic blood pressure of group A was significantly higher compared to group C, group D, group F ($p < 0.001$, table 1) and group B ($p < 0.05$, table 1). Random blood sugar was not comparable in all the 6 subgroups of study subjects ($KW = 19.994$, $p = 0.0013$). Mean random blood sugar was significantly higher in group F compared to

group A ($p < 0.01$) and group D ($p < 0.001$). There was no significant difference in random blood sugar among the other subgroups.

In a total of 200 singleton mothers studied, 98 were with thrombocytopenia (49%) and 102 were with normal thrombocyte count (51%). Data on frequency of study subjects in relation to platelet count in 6 subgroups of study subjects is presented as % in table 2 (% of total number of subjects with and without thrombocytopenia in each subgroup separately). In group A thrombocytopenia was observed in 59 subjects (70.23%); in

group B and group C it was observed in 23 subjects (54.76%, and 44.23% respectively, table 2); In group D thrombocytopenia was observed in 40 subjects (52.63%); in group E it was observed in 7 subjects (46.66%); and in group F thrombocytopenia was observed in 41 subjects (46.59%). In group A frequency of subjects with thrombocytopenia was significantly higher compared to subjects with normal platelet count ($p < 0.0001$, table 2). There was no significant difference in subjects with and without thrombocytopenia in group B, group C, group D, group E and group F (table 2).

Table 1 Data on baseline characteristics of singleton mothers with pregnancy related clinical conditions (values are mean \pm SD; sample size in parenthesis)

Variables	Group A (n=84)	Group B (n=42)	Group C (n=52)	Group D (n=76)	Group E (n=15)	Group F (n=88)
Age (yrs.)	29.66 \pm 3.86NS	29.35 \pm 4.91	28.73 \pm 4.44	29.10 \pm 4.61	29.46 \pm 3.50	28.40 \pm 4.23
BMI (kg/m ²)	26.23 \pm 2.85 NS	26.15 \pm 2.44	25.59 \pm 2.81	25.41 \pm 2.62	25.08 \pm 2.44	25.87 \pm 2.77
SBP (mmHg)	154.76 \pm 14.3 **	137.62 \pm 22.28	139.04 \pm 22.94	139.08 \pm 22.28	152.0 \pm 19.71	135.91 \pm 20.98
DBP (mmHg)	96.90 \pm 9.43 $\ddagger\ddagger$ *	89.52 \pm 15.13	85.19 \pm 12.28	87.10 \pm 13.74	90.00 \pm 13.09	87.04 \pm 14.31
RBS (mg%)	116.57 \pm 29.60	121.29 \pm 30.47	123.60 \pm 26.28	114.11 \pm 26.41	112.53 \pm 33.13	132.59 \pm 24.59 $\dagger\dagger$

Group A= Pregnancy Induced Hypertension; Group B= Anemia, Group C = Foetal Distress Syndrome; Group D = Oligohydramnios, Group E = Polyhydramnios; Group F = Gestational Diabetes. NS = non-significant compared to group B, C, D, E and F.

** $p < 0.001$ compared to group B, group D and group F.

$\ddagger\ddagger$ $p < 0.001$ compared to group C, D and F; * $p < 0.05$ compared to group B

$\dagger\dagger$ $p < 0.001$ compared to group A and group D.

Table 2 Data on frequency of study subjects with and without thrombocytopenia in subgroups study group based on pregnancy related clinical conditions

(data is presented in % of total study subjects in each subgroup. Sample size of each subgroup is presented in parenthesis)

Subgroups of study subjects	With thrombocytopenia	With normal platelet count	P value
A (n=84)	70.23%	29.76%	<0.0001
B (n=42)	54.76%	45.23%	0.504
C (n=52)	44.23%	55.76%	0.523
D (n=76)	52.63%	47.36%	0.510
E (n=15)	46.66%	53.33%	0.850
F (n=88)	46.59%	53.40%	0.644

Group A= Pregnancy induced hypertension; Group B= Anemia; Group C =Foetal Distress Syndrome; Group D = Oligohydramnios; Group E= Polyhydramnios; Group F = Gestational diabetes

DISCUSSION

In this study we examined the low platelet count in relation to commonly

observed pregnancy related clinical conditions. The results of our study demonstrate that thrombocytopenia is mainly a characteristic feature of pregnancy induced hypertension.

In the present study 49% percent of study subjects were with thrombocytopenia. Among these subjects 60.20% were diagnosed with pregnancy induced hypertension (PIH). In the pregnancy induced hypertension group frequency of subjects with thrombocytopenia was significantly higher compared to with normal platelet count (table 2). But in subjects with other clinical conditions there was no significant difference in frequency of subjects with and without thrombocytopenia

(table 2). This observation suggests that thrombocytopenia is mainly associated with pathogenesis of PIH.

Nazli R et al have reported high frequency of thrombocytopenia in PIH mothers. ^[5] In their study the severity of thrombocytopenia was proportional to the severity of pregnancy related hypertensive disorders. ^[5] In the study of Rahim et al 74.28 % of low birth weight babies were observed in PIH mothers with thrombocytopenia. ^[6] In the study by Hossain et al thrombocytopenia was associated with a higher prevalence of preterm delivery and intrauterine growth retardation; and was also found to be an independent and important risk factor in the occurrence of maternal and perinatal complications in pregnancy. ^[7]

Preeclampsia is a pregnancy-specific disease manifested by hypertension, coagulopathy, and impaired tissue perfusion. ^[8] At present, there is no single screening test that is considered reliable and cost-effective for predicting preeclampsia. Etiology of preeclampsia remains unclear, and it is possible that the rise in blood pressure is a manifestation of more than one pathophysiological condition. Association observed between low platelet count and PIH in our study and in several other studies ^[9-11] suggest that periodic assessment of platelet count during pregnancy may aid in detection and management of pregnancy induced hypertension.

However, based on our study findings it could be concluded that among the common clinical conditions associated with pregnancy thrombocytopenia is mainly associated with PIH.

REFERENCES

1. Guyton AC. Haemostasis and Blood Coagulation. In: Guyton AC and Hall JE. Text Book of Medical

- Physiology, Elsevier Saunders, Philadelphia, 2006; 457-468.
2. Samson Wright. Blood platelets. In: Cyril A.Keele, Eric Neil, Norman Joels (Eds.). Samson Wright's Applied Physiology, Oxford University Press 2002;29-32.
3. Boehlen F. Thrombocytopenia during pregnancy. Importance, diagnosis and management. Hamostaseologie. 2006; 26:72-4; quiz 75-8.
4. Levy JA, Murphy LD. Thrombocytopenia in Pregnancy. J Am Board FamPract 2002; 15:290-7.
5. Nazli R, Khan MA, Akhtar T, Mohammad NS, Aslam H, Haider J. Frequency of thrombocytopenia in pregnancy related hypertensive disorders in patients presenting at tertiary care hospitals of Peshawar. Khyber Med Univ J 2012; 4:101-105.
6. Rahim R, Nahar K, Khan IA. Platelet count in 100 cases of pregnancy induced hypertension. Mymensingh Med J. 2010; 19:5-9.
7. Hossain N, Shah N, Khan N, Lata S, Khan NH. Maternal and Perinatal Outcome of Hypertensive Disorders of Pregnancy at a Tertiary Care Hospital. J Dow Univ Health Sci 2011; 5: 12-16.
8. Vural P, Akgul C, Canbaz M. Calcium and Phosphate Excretion in Preeclampsia. Turk J Med Sci 2000; 30: 39-42.
9. Rahim R, Nahar K, Khan IA. Platelet count in 100 cases of pregnancy induced hypertension. Mymensingh Med J. 2010; 19:5-9.
10. Mohapatra S, Pradhan BB, Satpathy, UK, Mohanty A, Pattnaik JR. Platelet estimation : its prognostic value in pregnancy induced

hypertension. Indian J Physiol Pharmacol 2007; 51: 160–164.
11. Anjali NS, Garkal KD, Deshmukh PR. Physiological parameters in

pregnancy induced hypertension. International Journal of Recent Trends in Science And Technology 2013; 7: 24-25.

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