Low Platelets Counts as a Predictor of Preeclampsia in High Risk Pregnant Females

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ABSTRACT

Background: Pregnancy Induced Hypertension (PIH) is the prevalent and potentially life threatening complications of pregnancy. It comprises of gestational hypertension, pre-eclampsia as well as eclampsia.

Aim: To assess the association of low platelets count as indicator of hypertensive disorder of pregnancy in females attending antenatal clinic for routine check-up

Methods: This Case control study was done at Department of Obstetrics & Gynecology, Lahore General Hospital Lahore for 6months. 200 pregnant females in the last trimester were selected. Patients of age range 15-45 years, presenting in 3RD trimester were selected. Blood sample was taken to assess platelet count and levels were noted.

Results: The mean age of cases and the controls was 24.85±8.03 years and 27.56± 8.12 years respectively. The mean gestational age 32.30$\pm$ 7.23weeks. Mean platelet count among cases as 1.526 ±0.514 lac/mm^{3}and controls was 2.10±0.392 lac/mm^3. Low platelets count was 66% in cases and32% in controls, which was significantly associated with hypertensive disorder of pregnancy (OR=6.47, 95% CI;3.36-12.45, p=0.001).

Conclusions: Our study results showed that low platelet count is associated significantly with pre-eclampsia. Thus low platelet count is found to be a very important investigation for the pregnant females to predict PIH or preeclampsia in early stages.

Key words: Pregnancy induced hypertension, preeclampsia, platelet count, blood pressure, thrombocytopenia

INTRODUCTION

Pregnancy Induced Hypertension (PIH) is one of the most prevalent and potentially life threatening complications of pregnancy. In particular in developing nations, 5-8% of all pregnancies are greatly affected by PIH[1]. PIH can be classified as gestational hypertension alone without presence of proteinuria[2]. PIH can lead to pre-eclampsia as well as eclampsia. It can occur develop in around 11-29% pregnant females. Out of all other parameters, the platelet count is a simple and cost-effective way to predict PIH[3]. Preeclampsia is defined as the presence of hypertension ≥ 140/90mmHg after 20t week of pregnancy among females who are normotensive before conception. [4]The particular pathophysiology of pre-eclampsia is still not understood fully. But, abnormal implantation of placenta can also be an initial event[5]. It is also indicated that pre-eclampsia can also be associated with endothelial dysfunction and placental hypoxia[6].

Many researchers gave their efforts to identify the unique screening test that would predict the risk of developing preeclampsia before the classic symptoms appear. There are several studies which recommend that platelet can have significant role in etiopathogenesis of preeclampsia[7]. Out of all the hematological fluctuations, which occur in the presence of preeclampsia, the thrombocytopenia or low platelet count is most common. It is classically defined as platelet count <150,000/mm^3.[8]. The extent of thrombocytopenia up surges or in other words platelet count further decreases with the increasing severity of hypertensive disorder of pregnancy. as well as, lower platelet count can rise the rate of feto-maternal

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morbidity and mortality[9]. Most of the studies observed significant decrease in platelet count during normal pregnancy. There is a significant decrease in platelet count especially during second and third trimesters. Thrombocytopenia can result from decrease in platelet production or accelerated platelet destruction.[10] Thus this study was designed to determine the association of platelet count with pre-eclampsia.

The objective of the study was to find the association of low platelets count with hypertensive pregnancy in patients presenting during second trimester of pregnancy

MATERIAL & METHODS

This was a Case control study was conducted in the Department of Obstetrics & Gynecology, Lahore General Hospital, Lahore during a period 6 months from March to August 2019. Sample size was 200 females, calculated keeping confidence level=95%, margin of error=6.5% and frequency of PIH = 29% among Asian population. Sampling technique used was Non probability, consecutive sampling

Inclusion: Females aged between 15-45 years

Cases: 100 Pregnant Females diagnosed with PIH/preeclampsia beyond 24 weeks gestation of pregnancy were included

Control: 100 healthy pregnant females with no risk factors (normal pregnancy)

Exclusion Criteria: Hemorrhagic disorder before pregnancy, patients taking medicines which cause thrombocytopenia or chronic hypertension were excluded from the study

Procedure: Two hundred females attending the antenatal clinical of Department of Obstetrics & Gynecology were included. Informed consent was obtained. Demographic details of patients were obtained. Patients were divided in

two groups i.e. cases with preeclampsia or PIH and control without hypertensive disorder of pregnancy. Cases were subdivided in to mild or moderate to severe preeclampsia. After a detailed history, lab investigation and clinical examination were done as per hospital protocol. Blood sample was taken and sent to the laboratory for assessment of platelet count. Reports were assessed and platelet count was noted. If level was <1.5lc/mm^3, then low platelet count was labeled. All the data was recorded in proforma.

Data Analysis: SPSS version 21.0 was used to enter and analyzed the data. Association of low platelet count with preeclampsia was measured by calculating odds ratio with 95% confidence interval. OR>1 was taken as significant.

RESULTS

In this study, we included 200 patients; 100 cases and 100 controls. The mean age of cases was 24.85±8.03 years and the mean age of controls was 27.56± 8.12years.The mean gestational age of cases was 32.30±7.23 and control was 26.86±6.93. Table1 shows that 66% cases were primiparous and 34% multiparous. The 68% of multiparous was in control group (Table 1).

The mean platelet count of cases was 1.526 ±0.514 lac/mm^{3}and controls was 2.10±0.392lac/mm^3. The

difference was significant (P = 0.001). Low platelets count was 66% in cases and 32% in controls, which was significantly associated with hypertensive disorder of pregnancy (OR=6.47, 95% CI; 3.36-12.45, p=0.001) (Table 2)

Table 3 shows that 42.1% of the patients with severe Pre-eclampsia, 15.8% with mild preeclampsia and 21.1% with PIH group had platelets count in< 1 lac/mm^3. 27.8% with PIH, 50% patients had severe preeclampsia in the range of 1-1.5 lac/mm^3. 5.6% patients in eclampsia group and 16.7% patients in mild pre- eclampsia cases had the platelets count between 1-1.5 lac/mm^3. 40.9%patients in mild Pre- eclampsia group had platelets count more than 2 lac/ mm^3. 27.3% in severe pre- eclampsia and 22.7% in eclampsia cases had platelets count more than 2 lac/ mm^3. In control group 66% platelets counts more than 2 lac/mm^3.

Table 1: Distribution of age categories with PIH group of Cases& Control

	Case	Control
Age (years)	24.85±8.03	27.56± 8.12
Gestational age	32.30±7.23	26.86±6.93
BMI	28.30±1.2	20.6±1.9
Parity	Frequency (%)	
Primiparous	66(66%)	32(32%)
Multiparous	34(34%)	68(68%)

Table 2: Platelets count in cases versus controls

Parameter	Case (n=100)	Control (n=100)	P value
Platelets count(**lac/mm^3**)	1.526 ±0.514	2.10±0.392	< 0.001
Low platelet count	57(77%)	17(23%)	6.47
Normal platelet count	43(34.1%)	83(65.9%)	(3.36-12.45)

Table 3: Distribution of platelet count in different stage of hypertensive disorder of pregnancy (n=100)

Platelets count (cells/mm^3)	PIH	Mild preeclampsia	Severe preeclampsia	Eclampsia	Total
<1	4(21.1%)	3(15.8%)	8(42.1%)	4(21.1%)	19
1-1.5	10(27.8%)	6(16.7%)	18(50%)	2(5.6%)	36
1.5-2	3(13.6%)	10(45.5%)	7(31.8%)	3(9.1%)	23
>2	2(9.1%)	9(40.9%)	6(27.3%)	5(22.7%)	22
Total	19	28	39	13	100

DISCUSSION

Hypertension is one of the most common obstetrics problems, leading in preeclampsia and eclampsia which in turned associated with thrombocytopenia. [11]Preeclampsia is one of the world's main mortality and morbidity among females, especially in developing countries. Approximately 6% preeclampsia affects in all pregnancies. More often in the 20-30 age group primigravidas. In unites States, Preeclampsia accounts for 17.6% of maternal deaths[12.]

The mean age of the cases in present study was 24.85±8.03 years as compared to 24.75±3.36 years in Prakash J; 25.52±4.38 years in Priyadarshini G et al and 25±3.02 years in Kumar et al study.[13, 14]We observed that there is little or no difference in age between normal healthy pregnant females and patients with severity of pregnancy due to hypertension. Mostly females fall in 25-35 years age group. However, in Chaware et al study the maximum number of patients in mild preeclampsia, severe preeclampsia and eclampsia were in the age group of 20-24 yrs[15].

The mean platelet counts in both the case and control group was compared with other studies conducted by Chaware SA et al, Mohapatra S et al, Agarwal et al,[15, 16]In previous studies including our study, the mean platelet counts in the controls was >2.2 lac/mm^3 and it also established a decreasing trend as the severity of pre-eclampsia increased even though in most of the studies the normal range of mean platelets count were in 1.5- 3 lac/ mm^3. But in eclampsia the mean platelet count was seen to be 1-1.5 or below 1 lac/mm^3.The mean gestational age observed in cases in the present study was 32.30± 7.23weeks. In subgroups of cases the mean gestational age in mild preeclampsia and severe preeclampsia were found to be 30.15±8.72 and 32.56±4.546 weeks respectively. Statistically, these differences were found to be insignificant. Priyadarshini et al, and Jahromi et al., also observed similar findings with that of present study, their findings were also statistically not significant[17].

In our study, 39.4% females had preeclampsia and 13.1% females had eclampsia. The results are in line with another study conducted in Pakistan, the platelet count was evaluated in 84 pregnant females via direct visual method.

Thirty females were taken as control, while among cases, 27 had preeclampsia and 27 females had eclampsia. There was significantly (P < 0.01) less platelet count in females with preeclampsia and highly significant (P < 0.001) in females with eclampsia than females in controls[18.]

CONCLUSION

Platelet count is a very important investigation for the pregnant females having PIH. Our study results showed that reduced platelet count is significantly associated with hypertensive disorder or especially preeclampsia. This information can help to enhance the current data and helps the obstetricians to screen the pregnant females for platelet count in order to predict the risk of pre-eclampsia. So it can be concluded that platelets counts to be used as an optimal screening test for early detection of preeclampsia and prediction of its severity, more study is therefore needed in this field.

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