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ORIGINAL ARTICLE

Association of Preeclampsia with Low Platelet Count among Pregnant Females Presenting during Third Trimester - A Case Control Study

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ABSTRACT

Aim: To determine the association between presenting for antenatal check-up
Methods: Study conducted in the Department of Obstetrics & Gynecology, Lahore General Hospital of Lahore during 15-5-2019 to 15-11-2019 and consented to participate were considered for the study. 35 were with preeclampsia (Cases) and 35 were without (Control). The data was entered and analyzed using SPSS 25. For categorical data analysis chi square test was used using p-value ≤0.05. **70** Women of age 18-40years, parity of 20 weeks (on LMP)
Results: The study results showed that the mean age of the cases group was 29.54±6.284 years whereas the mean age of control group was 28.83±7.213 years. In the present study among cases the low platelets count was noted in 26(74.3%) patients while among control group the low platelets count was found in 17(48.6%) patients. Odds of developing preeclampsia among patients aged below or equals to 30 years was 3.97 [95% CI: 0.95-16.52] whereas among aged >30, was 3.06 [95% CI: 0.68-13.78]. The odds of developing preeclampsia among low platelet count subjects with normal BMI was 3.50 [95% CI; 0.69-17.71]
Conclusion: Low platelets count was associated with preeclampsia. It was found that pregnant females with low platelet count has significantly greater odds of developing preeclampsia as compared to normal platelets count females presenting during third trimester of pregnancy.
Keywords: Pregnant Female, Low platelet count, Preeclampsia, Pregnancy, Case Control Study

INTRODUCTION

Among pregnant female, 5 – 10% of the female are affected with preeclampsia[1]. As the exact patho-physiology is unknown there could be many reason of the obstetrical problem. Reduced supply of nutrients (trophoblast) triggers the placenta to initiates increased vascular permeability that causes endothelium injury. In response to the injury coagulation system is activated and platelets are consumed[2]. It is observed that the patients with preeclampsia in third trimester have relatively low coagulation and high fibrolysis tendency that may leads to postpartum hemorrhage and other adverse outcomes [3, 4]. On the other hand a research reveals that physiological changes occur to provide adequate nutrients to fetus. Visceral fat accumulation is one of them which may lead to metabolic complications.[5] A case control study conducted in Lahore general hospital reveals that 66% of cases and 32% of controls had low platelet count, with the odds of 6.47, revealing that low platelet count could be a predictor for diagnosis of preeclampsia in early stages. [6]

Mix results have been documented regarding association between platelet count and preeclampsia. A study reveals that fibrinogen level ≤ 2.87 g/L is a good biomarker for screening of severe preeclampsia with sensitivity of 68% and specificity 98% [7] on other hand AlSheeha et al. 2016 documented that Platelet count less than 248.010×10^3/µL has 2.2 times more chance of preeclampsia [2] recent studies found that platelet count (PC) to Mean platelet Volume(MPV) ratio is better measure than platelet count as the case control study results showed that PC/MPV ratio of preeclampsia group 24.63 ± 10.90 were significantly lower than 27.63 ± 10.24 the control group. The cut-off value of MPV was 9.15 with 58.7% sensitivity and 61.7% specificity [8]another study documented cut-off point of 8.15 (sensitivity 66.7%, specificity 56.3%)[9].

The Current study has been conducted to determine the association between the low platelet count and preeclampsia as mix results has been found in the previous literature. The contributing factors like BMI and parity has also been determined.

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SUBJECTS & METHODS

In this, disease and parity based, case control study 35 cases and equal controls were taken using non probability convenient sampling. The Women of age 18-40 years, parity of 20 weeks (on LMP), presenting for antenatal check-up visited Department of Obstetrics & Gynecology, Lahore General Hospital of Lahore during 15-5-2019 to 15-11-2019 and consented to participate were considered for the study. Female with chronic or gestational diabetes (BSR>186mg/dl), chronic hypertension (BP≥140/90mmHg), renal disease (creatinine >1.2mg/dl), liver problem (ALT>40IU, AST>40IU), anemia (Hb_2), established DIC, idiopathic thrombocytopenic purpura, history of illicit drug use, any associated inflammatory disease or sepsis (on medical record) were excluded from the study. Two groups were formed i.e. cases with preeclampsia and controls without preeclampsia. Then blood sample was obtained by using 3cc disposable syringe and sample was sent to the laboratory of the hospital for assessment of platelet count. Report was assessed and platelet count was noted. If platelet count <150 $x10^9$/L, then low platelet count was labeled (as per operational definition). Females with low platelet count were managed as per hospital protocol. All this information was recorded through pre-designed proforma. All patients with preeclampsia were managed as per standard protocol. Permission from Institutional IRB was granted.

The collected data was analyzed statistically by using SPSS version 21. Quantitative variables like age, gestational age, BMI and platelet count was presented as mean ± S.D. Qualitative variables like low platelet count was presented as frequency and percentage. Chi square test was calculated to measure association between preeclampsia and low platelet p-value<0.05 was taken as significant. Data was stratified for age, gestational age, BMI, parity and previous history of pre-eclampsia. Post-stratification, adjusted OR was calculated for each strata. An OR>3 was taken as significant.

RESULTS

The study results showed that the mean age of the cases group was 29.54±6.284 years whereas the mean age of control group was 28.83±7.213 years. Mean gestational age of the cases group was 29.94±6.72 weeks whereas the mean gestational age of

control group was 31.89±5.95.weeks. Mean BMI of the cases group was 28.51±4.17 kg/m2 whereas the mean BMI of control group was 25.94±4.21 kg/m^2.

Table 1: Comparison of different anthropometric measures

	Case	Control	p-value
Age (Years)	29.54±6.284	28.83±7.213	0.662
Gestational Age (Weeks)	29.94±6.72	31.89±5.95	0.203
BMI (kg/m2)	28.51±4.17	25.94±4.21	0.013*
Platelet Count x 10^9/L	145.37±68.84	199.26±91.42	0.007*

Independent Sample t test, *p-value significant at 0.05

In the present study among cases the low platelets count was noted in 26(74.3%) patients while among control group the low platelets count was found in 17(48.6%) patients. An odd of developing preeclampsia due to low platelet count was 3.05 [95% C.I. 1.11-8.37] times higher than among cases group. Similarly odds of developing preeclampsia among patients aged below or equals to 30 years was 3.97 [95% CI: 0.95-16.52] among cases as compared to controls whereas odds of preeclampsia due low platelets count among patients aged >30, was 3.06 [95% CI: 0.68-13.78]. Odds of developing preeclampsia with low platelets count among subjects with gestational age ≤30weeks was 3.50 [95% CI: 1.11-11.07] and among subjects with gestational age >30 weeks was 4.80 [95% CI: 0.39-58.01] in cases as compared to controls.

The odds of developing preeclampsia was 4.12 [95% CI; 0.65-26.00], as compared to control among primiparous. The odds of developing preeclampsia was 3.56 [95% CI; 0.99-12.73] as compared to control in multiparous. The odds of developing preeclampsia among low platelet count subjects with normal BMI was 3.50 [95% CI; 0.69-17.71] & among overweight or obese was 2.67 [95% CI; 0.64-11.07].

DISCUSSION

After anemia Thrombocytopenia i.e. blood platelet count below 150 x10^9/L is the second leading cause of blood disorders in pregnancy. [10] Literature suggests that platelet may play a major role in the etio-pathogenesis of preeclampsia. [11, 12] Changes in coagulation system i.e. low platelet count in preeclampsia are associated with abnormal activation of coagulation system and accelerated platelet consumption[13] the current study is also additive evidence to the fact.

In the current case control study the parity was same in cases and controls. In the present study among cases the low platelets count was noted in 26(74.3%) patients while among control group the low platelets count was found in 17(48.6%) patients. The results are similar to previous documented literature. As negative correlation was found between platelet count and hypertension[6].

Increased body mass is another contributing factor [5] as the obesity alters the on lipid profile and increase triglycerides and LDL level increase the blood pressure on the other hand the role of insulin resistance due to adiponectin and high blood pressure is also documented [14]. A study reveals that the relative risk of preeclampsia in patients with visceral fat of quintile 5 was 3.39 as compared to lower quintiles[15] In the current study the data was stratified according to Body Mass Index (BMI) and it was observed that among normal body weight subjects odds of preeclampsia was 3.56 as compared to normal platelet count.

In the present study there are some strength like the adjusted odds ratios have been computed regarding age, gestational age, BMI and parity. Whereas there are some short comings like the pattern of weight gain have not been assessed. The visceral fat accumulation assessment using ultrasound can be helpful. Similarly the controls must be compared according to parity as well as age group. Therefore the future researchers are highly recommended to compare the cases with age, BMI and Parity matched controls for better results.

CONCLUSION

Females with low platelets count pregnant has significantly greater odds of developing preeclampsia as compared to normal platelets count females presenting during third trimester of pregnancy. Similarly the adjusted odd ratio for primiparous reveals that the chances of preeclampsia were 4.12 among low platelets count pregnant female similarly adjusted for normal body weight the odds ratio of preeclampsia was 3.56 among low platelet count pregnant female.

Conflict of interest: Nil

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