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**Original Article**

# Association Between Placenta Previa and Preeclampsia

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## Abstract

**Background: To determine association between placenta previa and pre-eclampsia in pregnant women presenting to a tertiary care hospital.**

**Methods: In this prospective study 187 pregnant women with placenta previa and 187 pregnant, total 374, women without placenta previa were enrolled. Ultrasonography examination was performed on all patients to ascertain the attachment of placenta on uterine wall. All patients were followed every fourth week till 38th weeks. Pre-eclampsia was labelled if mean of three readings of blood pressure was more than 139/89 in a pregnant woman with history of normal blood pressure before pregnancy and proteinuria on urine laboratory examination.**

**Results: Mean age was 27.23 ± 3.633 and ranged from 21 to 43 years. Primipara were 45.7% and 54.3% were multipara. Eight patients (2.1%) were having pre-eclampsia. All patients belonged to non-placenta previa group. Relative risk came out 1.045 ranging from1.014 to 1.077 at 95% confidence interval. There was no effect of age and parity on the association.**

**Conclusion: There is a protective association between placenta previa and pre-eclampsia in pregnant women.**

**Key Words: Placenta previa, Pre-eclampsia, Pregnancy induced hypertension, Parity**

## Introduction

Hypertension complicates up to 10% of all pregnancies and is associated with increased risk of adverse fetal, neonatal and maternal outcomes, including preterm birth, intrauterine growth restriction, perinatal death, acute renal or hepatic failure, antepartum hemorrhage, postpartum hemorrhage and maternal death.[1, 2] Pregnancy hypertension has its onset from 20 weeks of gestation and ranges from hypertension alone through proteinuria and multi-organ dysfunction to seizures.[3] Between 2011 and 2013, pregnancy-induced hypertension caused 7.4% of maternal deaths in the United States.[4] Pre-eclampsia may be superimposed on pre-existing chronic hypertension. Although pre-eclampsia represents the severe end of the spectrum, women with any form of pregnancy hypertension are at increased risk of adverse outcomes.[5, 6] In a study PIH have demonstrated an increased risk for intrauterine growth retardation.[7]

Placenta previa is associated with major pregnancy complications and is thought to be becoming more common.[8] It is also associated with PIH.[9] Some studies reported the protective effects, other studies did show any associations, slightly increase in the incidence and significantly elevated incidence of spectrum of hypertension ranging from PIH to eclampsia in women with placenta previa.[9, 10] Placenta previa was a significant protective factor of pre-eclampsia showing negative association.[6, 9] In another Japanese study, Preeclampsia was observed in 0 and 4.1% of women with and without placenta previa, respectively.[11, 12] But the impact of these changes is largely unknown.[5] Validation of the above mentioned results in our local population i.e. reduced frequency of pre-eclampsia in patients with placenta previa may help us make certain management decisions. Evidence based counselling will be possible for patients with previous abortions and miscarriages secondary to pre-eclampsia as there would be no risk if they have placenta previa.

## Patients and Methods

This prospective cohort study was conducted in Department of Gynaecology, Sir Ganga Ram Hospital, Lahore from October 2014 toApril 2015.Using 95% confidence interval and 80% power of study, taking frequency of pre-eclampsia 0% and 4.1% (7) in groups with and without placenta previa respectively, estimated sample size is 374 i.e. 187 in each group. Pregnant women of age 18-45 years at gestational age <24weeks (determined by last menstrual period) were included. One group women were with placenta previa determined by ultrasonography while second group women were without placenta previa. Females with history of chronic hypertension, diabetes (HbA1C level > 7%), severe anaemia (haemoglobin level, < 8 g per deciliter)measured by chemical analyzer, history of in vitro fertilization and history of anti-phospholipid syndrome or systemic lupus Erythematosus were excluded.Placenta previa was determined by ultrasonography before 24 week

gestation and defined as placental anchorage within 3 cm of internal os. One hundred and eighty seven pregnant women with placenta previa and 187 pregnant women without placenta previa according to selection criterion were enrolled. Ultrasonography examination was performed on all patients to ascertain the attachment of placenta on uterine wall. All patients were followed every fourth week till 38th weeks. Pre-eclampsia was labelled if mean of three readings of blood pressure was more than 139/89 in a pregnant woman with history of normal blood pressure before pregnancy and proteinuria on urine laboratory examination. Risk ratio was calculated to determine the association between pre-eclampsia and placenta Previa. p value <0.05 was considered significant.

# Results

The mean age of patients was 27.23 ± 3.633 ranged from 21 to 43 years of age. There were 144 patients (38.5%) <25 years of age whereas 230 patients (61.5%) were more than 25 years in age (Table 1). About 171 patients (45.7%) were primipara and 203 patients (54.3%) were multipara. Out of 374 patients only 8 patients (2.1%) were having pre-eclampsia. The frequency of pre-eclampsia was significantly higher among case group as compared to control group (p=0.004) (Table 2). Relative risk came out 1.045 (95% confidence level; 1.014 to 1.077)(Table 2)

**Table 1: Baseline characteristics of patients**

| | |
|---|---|
| Age | 27.23±3.63 |
| Age<25years | 144(38.5%) |
| Age≥25years | 230(61.5%) |
| Primiparity | 171(45.7%) |
| Multiparity | 203(54.3%) |

**Table 2: Association of preeclampsia and placenta previa**

| | | Preeclampsia | | Total |
|---|---|---|---|---|
| | | Yes | No | |
| Placenta previa | Yes | 8(100%) | 179(48.9%) | 187 |
| | No | 0 | 187(51.1%) | 187 |
| Total | | 8 | 366 | 374 |

Relative Risk = 1.045 (95%CI;1.014, 1.077)

# Discussion

Iimportant health problems among adolescents in the developing countries are increased incidence of preterm labour and delivery, hypertensive disease, anaemia, more severe forms of malaria, obstructed labour, poor maternal nutrition and poor breastfeeding, low birth weight and increased neonatal mortality and morbidity.[13-15]PIH has its onset from 20 weeks of gestation and ranges from hypertension alone (gestational hypertension) through proteinuria and multi-organ dysfunction (pre-eclampsia) to seizures (eclampsia).[3]Pre-eclampsia may be superimposed on pre-existing chronic hypertension. Although pre-eclampsia represents the severe end of the spectrum, women with any form of pregnancy hypertension are at increased risk of adverse outcomes.[5] Awareness of risk factors of pre-eclampsia can help to monitor patients, ensure earlier diagnosis and predict which patients are more likely to develop pre-eclampsia.[16] Placenta praevia is an obstetric complication in which the placenta is inserted partially or wholly in the lower uterine segment. It is a leading cause of antepartum haemorrhage (vaginal bleeding).[18]

Caesarean delivery is more likely in women with preeclampsia. It is to be remembered that delivery is the long-term cure, but most women get worse after delivery and most maternal deaths occur postpartum.[19, 20]Recently, it has been shown that placenta previa is associated with low frequencies of pre-eclampsia and low maternal blood pressure.[21] However, there is scant literature on the association between placenta previa and pre-eclampsia. While some studies reported the protective effects, other studies did show any associations, slightly increase in the incidence and significantly elevated incidence pre-eclampsia in placenta previa.[11, 22]Maternal risks with placenta previa include life threatening hemorrhage, anesthetic and surgical complications due to emergency cesarean delivery with sub optimal preparation for surgery. Postpartum hemorrhage, cesarean hysterectomy, postpartum sepsis, air embolism and abnormal degree of placental adherence can often occur.[23, 24]

In present study cohort, out of 374 patients only 8 patients (2.1%)developed pre-eclampsia. When we cross tabulated group with preeclampsia the results were significant (p value=0.004). All of the patients of pre-eclampsia were in category of no placenta previa.Relative risk came out 1.045 ranging from 1.014 to 1.077 at 95%Confidence interval. So we may reject the null hypothesis and may conclude that there is an association between placenta previa and preeclampsia in pregnant women. It also implies that placenta previa has a protective role as concerned with pregnancy induced hypertension. There should be a focus on mechanisms involving the placement and anchorage of placenta during early weeks of gestation.

Results of present study matches with previous studies. It was reported that placenta previa was a significant protective factor of pre-eclampsia(ORD 0.3,

95% CI: 0.1–0.7) showing negative association.[9] In another Japanese study, Pre-eclampsia was observed in 0 and 4.1% of women with and without placenta previa, respectively (p = 0.004).[11] About 144 patients (38.5%) in our study population were < 25years of age whereas 230 patients (61.5%) were > 25 years in age. It implies that there is still room to control or delay age of conception in our population by effective techniques of population control. 171 patients (45.7%) were primipara and 203 patients (54.3%)were multipara. In a Sudani Study, there were 3.2% women with pre-eclampsia out of 54,339 deliveries. The placenta previa occurred in 0% and 3.3%, p < 0.001 in pre-eclamptic and control women, respectively, thus it became a protective factor in this case.[22]

The results from one study clearly show a decreased frequency of pregnancy-induced hypertension among those pregnancies with placenta previa. It was noticed that the pathophysiologic mechanisms for this finding may be due to altered placental perfusion seen among women diagnosed with placenta previa.[25] On age stratification, after cross tabulation between pre-eclampsia and placenta previa, 2 pre-eclampsia patients were more than 25 years in age whereas 6 were having age less than 25 years but results were non-significant for both age groups (p=0.112 &0.037). These results imply that there is no role of advancing age on association between placenta previa and pre-eclampsia in pregnant women. When we performed parity stratification after cross tabulation between pre-eclampsia and placenta previa, 5 patients of pre-eclampsia were in group multipara and 3 were in group primipara. Results for both groups were non-significant (p=0.059 & 0.121). These result suggest that there is no role of parity on association between placenta previa and pre-eclampsia in pregnant women.

# Conclusion

Frequency of developing the pre-eclampsia is significantly different in groups with and without placenta previa (0% vs. 4.1%) (p value < 0.05). Relative risk came out 1.045ranging from 1.014 to 1.077 at 95% Confidence interval.

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