



## Second Trimester Placental Location as a Predictor of Adverse Maternal Outcome

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### ABSTRACT

**Objective:** Our purpose was to determine whether by ultrasonography of placental location at 18-24 weeks of gestation can predict maternal pregnancy outcomes. **Material and Methods:** Total of 250 antenatal cases between 18-24 weeks of gestational age were selected, 50 cases had fundal placental location (25 central and 25 lateral), 100 cases had anterior placental location (25 low central, 25 low lateral 25 normal central and 25 normal lateral) and 100 cases had posterior placental location (25 low central, 25 low lateral 25 normal central and 25 normal lateral). **Results:** It has been concluded that about 60% of cases with lateral placental location developed pre-eclampsia ( $p$ -value - 0.00002), while cases with low lying placenta developed postpartum haemorrhage ( $p < 0.001$ ). **Conclusion:** Lateral placental location was associated with an increased risk of pre-eclampsia. Low-lying placenta was associated with high risk of postpartum haemorrhage. **Key words:** Placental location, pregnancy outcome.

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**INTRODUCTION-** Placenta is an important connecting organ between mother and fetus, a lot of fetus problems, even the pathology of preeclampsia, related with placenta. Evaluation of the placenta should be a part of every pregnancy sonography; location, shape and size of the placenta should be considered<sup>1</sup>. The search for an ideal predictive test is still on, and preventive measures for preeclampsia remain challenging. The blood supply of uterus is not uniformly distributed. Uterus receives most of the blood supply from uterine arteries—a branch of internal iliac artery<sup>2</sup>. Preeclampsia is one of the important complications of pregnancy, and may lead to maternal mortality, which is defined as blood pressure more than 140 / 90 mm Hg, with proteinuria after 20<sup>th</sup> week of pregnancy in a normotensive, nonproteinuric women. Preeclampsia is more common in primiparous, with prevalence of 6% -7% as compare with multiparous (3% -4%)<sup>3</sup>. Early diagnosis of preeclampsia is very important to control of this problem. Pre eclampsia occurs only in presence of placenta.

There is a relationship between unilateral placental implantations (when more than 75% of placenta is implanted over the left or right side of uterus) and higher risk of preeclampsia. In pregnancies with unilateral placentas, uterine artery resistance is lower in the ipsilateral vs. contralateral uterine artery, while in pregnancies with centrally located placental resistance is similar between the two uterine arteries<sup>3</sup>. Bleeding from or into genital tract after birth of the baby up to end of puerperium which adversely affect the G.C of the cases is called PPH. An increased risk of postpartum haemorrhage is expected in low-lying placenta (implantation in the lower uterine segment). There are several physiologic explanations for the association between low placental location and postpartum hemorrhage. *Placental trophoblastism* throughout pregnancy encourages the placenta to grow towards the improved blood supply at the uterine fundus and away from the relatively low blood supply of the lower uterine segment. Initial placental location in the lower uterine segment may increase vascularization of this area, which could result in irregular separation and ineffectual contraction of these vascular beds after delivery<sup>5</sup>. Our purpose was to

determine whether by ultrasonography of placental location at 18-24 weeks of gestation (second trimester) can predict maternal pregnancy outcomes. The **aim of the study** was to find association between placental location at second trimester and maternal outcomes.

**MATERIAL AND METHODS-** This was a prospective, observational study conducted from January 2014 to July 2015 in M.L.B, Medical College & associated hospital, Jhansi. Cases were selected from the women attending the antenatal clinic, emergency or admitted in the Department of Obstetrics and Gynecology, M.L.B. Medical College, Jhansi. Total 250 antenatal cases between 18-24 weeks of gestational age were selected and followed up to delivery (C.S or vaginal). Before selecting the cases detailed history, general examination, systemic and obstetrical examination and relevant investigation were done. **Inclusion Criteria :** All Singleton pregnancy between 18<sup>th</sup> to 24<sup>th</sup> week of gestation attending the antenatal OPD, Emergency & ward of MLB, Medical College, Jhansi. **Exclusion criteria:** Multiple pregnancy, chronic hypertension, chronic renal disease, metabolic syndrome, associated infection and inflammation, Congenital anomalies. Each case was examined and investigated for pre eclampsia. Hypertension to the extent of 140/90 mmHg or more with proteinurea in a previously normotensive and non-proteinuric women is considered as PET.

**OBSERVATION & RESULTS -** Maternal and fetal outcomes was studied with respect to each placental location. Out of 250 cases 50 cases were having fundal placental location (25 central and 25 lateral), 100 cases were having anterior placental location (25 low central, 25 low lateral 25 normal central and 25 normal lateral) and 100 cases were having posterior placental location (25 low central, 25 low lateral 25 normal central and 25 normal lateral). About 60% (125) of cases with lateral placental location developed pre-eclampsia. Table 1 at the end of this article. The chi-square statistic was 17.46. The p-value was 0.000029. The result was significant. 5 (10%) cases of low anterior and 10 (20%) cases of low posterior developed PPH. Association of Low placental location with PPH was highly significant ( $p < 0.05$ ). Table 2 & 3 at the end of this article. The Chi-

square statistic was 15.176 & the p-value was 0.000098.

**DISCUSSION**-In our study around 60% of cases with lateral placenta developed pre eclampsia. Comparing with other studies done previously our result was significant. Table 4 at the end of this article compared the various studies done previously. Association of Low placenta with PPH was highly significant in our study. Sarah S et al 2012, in a study of 410 women with low placenta also concluded that women with a second trimester diagnosis of low placenta were at increased risk of postpartum hemorrhage<sup>10</sup>. These increased risks persisted even among women in whom the low placenta resolved (odds ratio, 2.72; 95% confidence interval, 1.46–5.07; odds ratio, 2.18; 95% confidence interval, 1.24–3.84). M. Torricelli et al, 2015 in a study of 2354 patients also concluded that anterior placenta has higher rate of PPH in vaginal delivery. Contrary to our study, E.F. Magann et al 2006, in a study of 3336 concluded that low implantation sites had a reduce risk of PPH<sup>8</sup> (OR 0.56, 95% CI 0.46 to 0.95 p=0.026). This may be because of our small sample size.

**CONCLUSIONS**- Cases with lateral placenta are more likely to develop preeclampsia. The association was 60.8% as compare to 34.4%. Low placenta was significantly associated with post partum hemorrhage. The association with low placenta is 15% and with high placenta is 2%.

**TABLE 1: PET VS PLACENTAL LOCATION**

	PET	Normal	Marginal Row Totals
Lateral placenta	76(59.5) [4.16]	49 (65.5) [4.16]	125
Central placenta	43 (59.5) [4.58]	82 (65.5) [4.16]	125
Marginal Column total	119	131	250 (Grand Total)

**TABLE 2: PPH VS PLACENTAL LOCATION**

	Fun-dal	Anterior				Posterior				
		Low		Normal		Low		Normal		
		C	L	C	L	C	L	C	L	
PPH	0	0	1	4	0	1	2	8	0	2
Per-centage	0%	0%	4%	16%	0%	4%	8%	32%	0%	8%

**TABLE 3: PPH VS PLACENTAL LOCATION**

	PPH	Normal	Row Totals
Low	15 (7.20) [8.45]	85 (92.80) [0.66]	100
High	3 (10.80) [5.63]	147 (139.20) [0.44]	150
Column Totals	18	232	250

**Table 4: Comparison of association of Preeclampsia and placental location with other study**

Study	Sample Size	Preeclampsia
Kofinas et al, 1989	311 total 153 normal	PIH 2.8 times more likely in cases with lateral placenta
Lieberman et al, 1991	106 866 total 491 placenta previa	Decrease incidence of preeclampsia in women with placenta previa (Low central placenta)
Liberati et al, 1997	732 total 481 lateral	No significant association between PIH and lateral placenta
Pai M et al 2005	426 total 102 lateral	2.7 times increase risk of preeclampsia in lateral placenta
Mangann et al, 2007	3336 total 328 lateral	No significant association
Devrajan K et al, 2012	799 total 133 lateral	No significant association
Sandhya K et al, 2015	300 total 168 lateral	overall risk of PET with laterally located placenta was 5.09 (odds ratio) and 95 % confidence interval (2.40 to 10.88)
Our Study	250 total 125 lateral	60% of cases with lateral placenta developed pre eclampsia.

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