



Role of Ultrasound in Prediction of Pre Eclampsia by Placental Location

Girija Malavalli Kempasiddaiah

Department of Obstetrics and Gynaecology, Bharatha Ratna Dr B.R. Ambedkar Medical College&Hospital, Bengaluru, Karnataka, India.

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ABSTRACT

To assess the relationship between placental location and development of Preeclampsia and its maternal and perinatal outcome. Patients attending antenatal clinic at second trimester in the Dept of OBG in Dr. B R Ambedkar Medical College and Hospital during June 2014 to December 2014. It is a prospective study. Out of 100 patients in the study, 61(61%) patients developed Preeclampsia. This study indicates that presence of lateral placenta strongly suggests preeclampsia and also shows that lateral placenta have high uterine artery resistance, so can be considered as screening method also.

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Introduction

The placenta was classified as central when it is equally distributed between right and left side of uterus irrespective of anterior, posterior or fundal position. When more than 75% of placental mass is towards one side of midline, then it was called unilateral right or left placenta.

Preeclampsia is a disease of trophoblastic tissue[1]. It is a complex clinical syndrome involving multiple organ systems and still remains the major cause of maternal and perinatal morbidity and mortality. Preeclampsia occurs only in the presence of placenta. Noninvasive Doppler studies of uterine arteries second trimester reveal abnormal waveforms suggestive of defective uterine perfusion due to placental implantation, when one artery is the dominant supply of the intervillous flow[2,3].

Placenta is an important connecting organ between mother and fetus, a lot of fetus problems, fetus size. Preeclampsia defined as blood pressure more than 140/90 mmHg, with proteinuria. Preeclampsia is more common in primiparus, with 6-7% as compared with multiparus which is 3-4%, so early diagnosis of preeclampsia is very important to control this problem[4,5].

Methods

This is a prospective study done in Department of Obstetrics & Gynaecology, Dr. B.R. Ambedkar Medical College & Hospital, from June 2014 to December 2014. Total of 100 antenatal women who attended the out patient department during second trimester(18-22wks) were included in the study. Pregnant women with chronic hypertension, other medical disorders, twins pregnancy, previous section and less than 18 wks are excluded from the study.

Result

Out of 100 women in the study, 50 of each formed into two groups. 61 women developed Preeclampsia in this study out of 100 women. The maternal characteristics like age, gravidity and parity were comparable in the centrally located and laterally located placental groups. Out of 61 women who developed preeclampsia, of whom 42(84%) had unilateral located placenta at 18-22 wks as compared with 19(38%) women who had centrally located placenta shown in Table 1. Age wise

distribution of women who developed preeclampsia in laterally placenta was 28(56%) as compared with 12(24%) women developed preeclampsia in central placenta shown in Table 2 & 3. Out of 50 women in lateral placenta, 29 women were primi and 21 women were multigravida shown in Table 4.

Discussion

Preeclampsia is a multiorgan system clinical syndrome responsible for maternal and perinatal morbidity and mortality. In our systematic review of literature, location of placenta as a potential predictor of preeclampsia dates back to first study by Kofinas et al [6]. They have reported 2.7 times high risk of developing preeclampsia in laterally located placenta so it is the likelihood of abnormal uterine artery waveforms in lateral placenta.

When the placenta is central, there is low resistance in both uterines. When the placenta is lateral, the uterine artery close to placenta has lower resistance than the opposite side.

Lieberman et al found that placenta previa was associated with lower rate of preeclampsia due to wider and free course of isthmus component of uterine artery[7].

In this study, out of 50 women with lateral placenta, 42(84%) women developed preeclampsia and 8(16%) were normotensive. Out of 50 women with central placenta, 19(38%) women developed preeclampsia and 31(62%) were normotensive. In our study, it was found that most women developing preeclampsia were in between 21-29 yr of age.

Out of 61 women with preeclampsia, we found about 25(41%) women developed preeclampsia before 32 wks of gestation, 20(33%) women between 32-37 wks, 13(22%) women between 37-40 wks and finally 3(4%) women after 40 wks developed preeclampsia.

Out of 42 women with lateral placenta who developed preeclampsia, 25 women required induction while 17 women went into spontaneous labor. 11 babies were preterm while 31 were term babies in the lateral placental study group. Among these 42 women with preeclampsia with lateral placenta, 12 required caesarean section and 30 women had vaginal delivery.

Table 1. Distribution of placenta

Placental Position	Patients with Preeclampsia	Patients without Preeclampsia	Total
Lateral	42(84%)	8(16%)	50(100%)
Central	19(38%)	31(62%)	50(100%)

Table 2. Age wise distribution with Lateral placenta

Age in yrs	With Preeclampsia	Without Preeclampsia
18-20	08(16%)	02(4%)
21-29	28(56%)	04(8%)
30-35	06(12%)	02(4%)
Total	42(84%)	08(16%)

Table 3. Age wise distribution with Central placenta

Age in yrs	With Preeclampsia	Without Preeclampsia
18-20	04(8%)	11(22%)
21-29	12(24%)	19(38%)
30-35	03(6%)	01(2%)
Total	19(38%)	31(62%)

Table 4. Gravida distribution with Lateral Placenta

Gravida	Primi	Multi	Total
With Preeclampsia	26(52%)	16(32%)	42(84%)
Without Preeclampsia	03(6%)	05(10%)	08(16%)

Out of 19 women with central placenta who developed preeclampsia, 13 women had vaginal delivery but 6 women required caesarean section.

Out of 61 women with preeclampsia in the study group, 2 babies were still birth, 2 babies had neonatal death, 13 babies needed neonatal care unit and 44 babies were normal.

In our study, placental laterality as determined by ultrasound at 18-22 wks as a screening test for development of preeclampsia. Risk of development of preeclampsia in lateral placenta is 68.85% and risk of development of preeclampsia in central placenta is 31.15%.

Thus ultrasound detection of lateral placenta in early 2nd trimester is an early indicator of predicting preeclampsia and placental localization can be used for intensive monitoring and even for early prevention and treatment in reducing mortality and morbidity in mother and fetus.

Conclusions

In this study, the presence of unilateral placenta is strongly associated with preeclampsia. One of the fundamental facts in patients with this condition is decreased uteroplacental blood flow. Patients with unilateral placenta have high uterine artery resistance. It also showed in this study, that morbidity of mother and babies were more in preeclampsia group as compared to normotensive group.

Conflict of Interest

The authors declare that there are no conflict of interest

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References

- [1] Walker JJ. Current thoughts on pathophysiology of preeclampsia / eclampsia. In: John Stud editors. Progress in obstetrics and gynaecology, Edinburg Churchill, Livingstone 1998:177-188.
- [2] Fleischer A, Schulman H, Farmakidis G, et al. Uterine artery Doppler velocimetry in pregnant women with hypertension. AM J Obstet Gynaecol 1986;154:806-813.
- [3] Schulman H, Winter D, Farmakidis D, Farmakidis G, et al. Pregnancy surveillance with Doppler velocimetry of uterine and umbilical arteries. AM J Obstet Gynaecol 1989;160:192-196.
- [4] Cunningham FG, Leveno KJ, Bloom SL, Hauth JC, Gilstrap III LC, Wenstrom KD. William's obstetrics. 23rd ed./New York: McGraw-Hill 2010;P.349-352,706-720,804-820,842-850.
- [5] Sibai BM. Pitfalls in diagnosis and management of preeclampsia. Am J Obstet Gynecol 1998;159:1-5
- [6] Kofinas AD, Penry M, Swain M, Hatjis CG. Effect of placental laterality on uterine artery resistance and development of preeclampsia and intrauterine growth retardation. Am J Obstet Gynecol 1989;161:1536-1539.
- [7] Leiberma Jr, Fraser J, Kasis A, Mazor M. Reduce frequency of hypertensive disorder and placenta previa. Obstet Gynecol 1991;77:83-610.