



ORIGINAL ARTICLE

THE STUDY OF PLACENTAL LATERALITY AND DEVELOPMENT OF PRE ECLAMPSIA

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ABSTRACT

OBJECTIVE: To study whether ultrasonically identified, placental laterality can be used as a predictor for development of preeclampsia. **METHODS:** The study was conducted in the Dept. of OBG, RMMCH, Annamalai Univ., Chidambaram from 2013 to 2015, in 150 AN women, attending AN clinic at 18-24 weeks of gestation without any high risk factor were subjected to USG examination, and placental location determined, and followed for the development of preeclampsia. **RESULT:** Out of 150 women, 73 had laterally located placenta and 77 centrally located placenta. 56 developed preeclampsia. Among them 39 had unilaterally located placenta at 20-24 weeks. This relationship was statistically significant ($P < 0.0001$). 2.47 times (odds ratio). **CONCLUSION :** From the above study, we concluded that females with laterally located placenta determined by USG at 18-24 weeks of gestation have 2.47 times greater risk of developing preeclampsia.

Keywords: Placental laterality, Preeclampsia, Central placenta

1. INTRODUCTION

Preeclampsia is a multi-system disorder of pregnancy. Preeclampsia occurs only in the presence of placenta. Several tests have been proposed to identify women at risk of developing preeclampsia. Some of the tests such as the cold pressor test, the isometric hand grip exercise, and the roll over test depend on the presence of some pathophysiological changes that occur in preeclampsia. Other tests such as the measurement of urinary calcium or plasma fibronectin are based on the presence of biochemical alterations peculiar to this disease. Among the various predictors for preeclampsia, the placental location by ultrasound at 18-24 weeks is very cost effective and non invasive.

2. MATERIALS AND METHODS

This prospective study was carried out in the Dept of Obstetrics and Gynecology, RMMCH, Annamalai University, Chidambaram, from 2013 – 2016.

INCLUSION CRITERIA

All pregnant women attending the antenatal clinic, from 18-24 weeks of gestation without any high risk factors were included in the study.

EXCLUSION CRITERIA

Pregnant women were excluded from the study if they were having chronic hypertension or essential hypertension, diabetes mellitus, thyrotoxicosis, renal disease, severe anemia, connective tissue disorder, positive lupus anticoagulant, anticardiolipin antibodies, Rh incompatibility, twin pregnancy, or positive VDRL test.

METHODOLOGY

All the cases were subjected to detailed history, general physical, and systemic as well as obstetrical examination at the time of their antenatal visit. The location of placenta was determined by ultrasound at 18-24 weeks in all the selected women and followed subsequently for the development of preeclampsia. The placenta was classified as central when it was equally distributed between the right and left side of uterus irrespective of anterior, posterior, or fundal position. When 75% or more of the placental mass was to one side of the midline, it was classified as unilateral right or left placenta. All women were followed throughout the pregnancy for the development of the signs and symptoms of preeclampsia. Preeclampsia was diagnosed on the basis of American Congress of Obstetricians and Gynecologists criteria for preeclampsia and is defined as new-onset hypertension (BP is ≥ 140 mmHg and/or ≥ 90 mmHg diastolic) occurring in a pregnant women after 20 weeks gestation, with proteinuria (defined as urinary excretion of ≥ 0.3 g

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protein in 24 hr).The end point of the study was the development of preeclampsia by ACOG criteria or delivery.

3.RESULTS

Out of the 150 women included in the study 48.7% (73) had lateral placenta among them 53.4% (39)developed preeclampsia . And 51.3% (77) had central placenta, among them 22.1% (17)developed preeclampsia. Among them 5.35%(3) had severe preeclampsia. And 3.6% (2) developed eclampsia. 1.7 % (1) developed HELLP syndrome.

Women of different age groups were included in the study. 53.3% (80) of women who developed preeclampsia belonged to the age group 21-25 years . This is accordance with MACGILLVIRAY'S report on age incidence of Pre-eclampsia which states that the incidence of pre-eclampsia is high among young primigravida.

The incidence of pre-eclampsia in primigravidae in this study was 64.7 % (97)and in multigravida is 35.3 % (53). The incidence of pre-eclampsia is high in primigravida than multigravida.

The chi-square test has been applied to find out whether percentage of preeclampsia varies by placental position of the selected antenatal women. p-value of the chi-square test is <0.001

The p-value of the chi-square test reveals that the occurrence of preeclampsia is highly significant and is influenced by placental position of the antenatal women.

Which is in accordance with the study by Bhalerao AV et al and Pai M et all1 and Parul S. Jani et al and women with lateral position of placenta have a relative risk of 2.47 times, ie., the risk of developing preeclampsia is 2.47 times higher in women with lateral position of placenta when compared to women with centrally placed placenta's

Table 1.INCIDENCE OF PREECLAMPSIA AMONG THE SELECTED ANIENATAL WOMEN

PREECLAMPSIA	FREQUENCY	PERCENTAGE
PRESENT	56	37.3
ABSENT	94	62.7

Table 2 TIME OF OCCURRENCE OF PREECLAMPSIA IN WEEKS

WEEKS	FREQUENCY	PERCENTAGE
20-25	1	1.8
26-30	12	21.4
31-35	7	12.5
36-40	36	64.3
>40	-	-

Table 3.DISTRIBUTION OF PATIENTS ACCORDING TO SEVERITY OF PREECLAMPSIA

SEVERITY OF PREECLAMPSIA	TOTAL	PERCENTAGE
MILD	53	94.64
SEVERE	3	5.35

Table 4 PLACENTAL POSITION AND OCCURANCE OF PREECLAMPSIA

POSITION	PREE CLAMPSIA		NORMAL		CHI-SQUARE TEST VALUE	P-VALUE
	NO.	%	NO.	%		
LATERAL	39	53.4	34	46.6	15.739	<0.001
CENTRAL	17	22.1	60	77.9		

4.DISCUSSION

Preeclampsia is a complex clinical syndrome involving multiple organ systems and still remains the principal cause of maternal and perinatal mortality and morbidity. The search for an ideal predictive test and preventive measure remains challenging.

It has been shown that in humans, both uterine arteries have a significant number of branches and that each supply the corresponding side of the uterus. Although the anastomoses between the two arteries exist, there is no proof that they are functional. When the placenta is laterally located, the uterine artery closer to the placenta has lower resistance than the one opposite to it. In women with centrally located placenta,both uterine arteries have similar resistance(3-5) and the uteroplacental blood flow needs are met by equal contribution from both uterine arteries. However, when the placenta is laterally located, in majority of the cases, the uteroplacental blood flow needs are met primarily by one of the uterine arteries with some contribution from the other uterine artery via the collateral circulation. The degree of collateral circulation may not be the same in all the women and deficient contribution may facilitate the development of preeclampsia,IUGR or both. The significance of normal placentation for cytotrophoblastic invasion is high and the cytotrophoblasts fail to adopt a vascular adhesion phenotype in preeclampsia. This may explain the reduced trophoblastic invasion in laterally situated placenta when the uteroplacental blood flow needs are mainly met by one side uterine artery.

The result is in accordance with Kofinas et.al who concluded that in women with unilateral placenta, the incidence of preeclampsia was 2.8-fold greater than those with centrally located placenta.

The results of the present study were also comparable to those of Muralidhar et al. in his study, a total of 426 unselected singleton pregnant women were included. Out of 426 women, 324 had centrally located placenta and 102 had unilateral placenta. A total of 71 women developed preeclampsia of which 52(74%) had unilaterally located placenta. The relationship was found to be statistically significant p<0.0001.

The results of the present study were also comparable to the STUDY DONE BY Lucy et al., the results of which showed that development of PIH and IUGR pregnancies were nearly fourfold more in lateral placentation.

5.CONCLUSIONS

From the above study, it is concluded that laterally located placenta on ultrasound done at 18-24 weeks is associated with increased risk of development of preeclampsia. Females with laterally located placenta have a greater risk of developing PIH, so these pregnancies may require careful obstetric management to achieve a more favorable outcome and decrease the maternal and perinatal morbidity and mortality associated with preeclampsia.

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