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Placental Position and Its Correlation to the Development of Preeclampsia

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Abstract: ***Introduction: Preeclampsia affects 5-8% of pregnant women, and it is the most important cause of maternal and perinatalmorbidity and mortality. In the past two decades, ultrasonography proved to be the easiest, safest, and mostaccurate method for assessing placental location. Aims and Objectives: To evaluate the relationship and the incidence of preeclampsia in patients with the centrally located placenta and in those with the laterally located placenta. Methodology: 200 pregnant women without preeclampsia with > 36 weeks of gestational age(Group A) were included in the study and 200 cases with preeclampsia (Group B) are included, and their placental position by USG were correlated retrospectively. The placenta is taken as central when it is located Anterior/ Posterior/ Fundal and placenta is taken as Lateral when it is located on the Right / Left lateral walls of the Uterus. Results: Among 200 pregnant women with preeclampsia, 88(44%) had centrally located placenta, and 112(56%) had laterally located placenta, So the overall risk of developing preeclampsia with laterally located placenta was found to be statistically significant (p-value 0.04). Conclusion: It is concluded that laterally located placenta on ultrasound isassociated with an increased risk of preeclampsia. So these pregnancies require careful obstetric management to achieve a more favorable outcome and to reduce the maternal and perinatal morbidityand mortalityassociated with preeclampsia. One of the major advantages of this study is it is not an extra test. From the routine ultrasonography, the location of the placenta can be used to correlate with the development of preeclampsia.***

Keywords: Pre-eclampsia, Placental position, Ultrasonography

1. Introduction

Hypertensive disorders in pregnancy are amongst the commonest medical disorders in pregnancy and are major causes of maternal and perinatal morbidity and mortality worldwide. Pre-eclampsia is a multisystem disorder of pregnancy which is characterized by new-onset hypertension (systolic and diastolic blood pressure of more than or equal to 140 and 90 mm Hg, respectively, on two occasions, at least 6 hours apart) and proteinuria that develops after 20 weeks of gestation in previously normotensive women[1].

Preeclampsia affects 5-10% of pregnant women[2]. There is a significant relation between placental location and uterine artery resistance and adverse outcomes such as preeclampsia and IUGR. In women with centrally located placenta, both uterine arteries demonstrate similar resistance. When the placenta is laterally located, the uterine artery close to the placenta has lower resistance than the one opposite from it. In the laterally located placenta, the uteroplacental blood flow needs to be met primarily by one of the uterine arteries with some contribution by the other uterine artery via collateral circulation. The degree of collateral contribution may not be the same in all women, and deficient contribution facilitates 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 the laterally situated placenta when the uteroplacental blood flow needs are mainly met by one side uterine artery[3].

Several tests have been proposed to identify pre-eclampsia based on the pathophysiologic changes that occur in pre-eclampsia. A few examples of these tests include the cold pressor test, isometric handgrip test, and the rollover test. Among the various predictors for preeclampsia, the placental location by ultrasound is very cost-effective and noninvasive[4].

In India, screening ultrasounds of a large proportion of pregnant women are undertaken, and they generally receive at least one obstetric ultrasound for gestational age, amniotic fluid volume, fetal anatomic survey, and the placental location. This study aims to find the relevance of the location of the placenta and its correlation to the development of pre-eclampsia

2. Aims and Objectives

1) To evaluate the relationship between placental location and occurrence of PIH.
2) To study the incidence of PIH in patients with the centrally located placenta and in those with the laterally implanted placenta.

3. Material and Methods

Subjects:
200 Pregnant women of more than 36weeks of gestational age without preeclampsia (Group A).
200 Pregnant women of more than 36weeks of gestational age with preeclampsia (Group B).

Study type: Cross-sectional study.

Study Area: Government Maternity Hospital, SV Medical College, Tirupati.

Inclusion Criteria:

- 200 Pregnant women of more than 36weeks of gestational age without preeclampsia (Group A).
- 200 Pregnant women of more than 36weeks of gestational age with preeclampsia(Group B).
- Singleton pregnancies
- Women who have given written informed consent

Exclusion Criteria:

- Pregnant women with chronic hypertension or essential hypertension, APLA, severe anemia.
- Pregnant women with medical disorders like Diabetes mellitus, Renal failure, Epilepsy, etc.

4. Methodology

Two hundred pregnant women without preeclampsia with > 36 weeks of gestational age(Group A) were included in the study, and 200 cases with preeclampsia with more than 36weeks gestational age(Group B) are included. History taking, General Examination, Systemic Examination, and their placental position by USG were correlated retrospectively. The placenta is taken as central when it is located. Anterior/ Posterior/ Fundal and placenta is taken as Lateral when it is located on the Right / Left lateral walls of the Uterus.

5. Results

Table 1: Placental position among pregnant women without preeclampsia

	Group A	
	Number	Percentage
Central	106	53
Lateral	94	47
	200	

Among 200 pregnant women without preeclampsia, 106(53%) had centrally located placenta, and 94(47%) had laterally located placenta.

Table 2: Placental position among pregnant women with preeclampsia

	Group B		P-value
	Number	Percentage	
Central	88	44	0.04.
Lateral	112	56	
	200		

Among 200 pregnant women with preeclampsia, 88(44%) had centrally located placenta, and 112(56%) had laterally located placenta, with p-value 0.04.

Table 3: Placental position among cases of mild preeclampsia

	Mild Pre-Eclampsia	
	Number	Percentage
Central	59	44.36
Lateral	74	55.63
	133	

Out of 200 preeclampsia cases, 133 were mild preeclampsia, out of which 59(44.36%) had central placenta, and 74(55.63%) had lateral placenta.

Table 4: Placental position among cases of severe preeclampsia

	Severe Pre –Eclampsia	
	Number	Percentage
Central	29	43.29
Lateral	38	56.72
	67	

Out of 200 preeclampsia cases, 67 were severe preeclampsia, out of which 29(43.29%) had a central placenta, and 38(56.72%) had a lateral placenta.

6. Discussion

In the present study, among 200 pregnant women without preeclampsia, 106(53%) had centrally located placenta, and 94(47%) had laterally located placenta. Similar results were observed in a study conducted by Bhattacharjee et al., found among 100 pregnant women, 66 had centrally located placenta, and 34 had laterally located placenta[4].

The common position of the placenta in pregnant women is central; this can be explained by the common position of blastocyst implantation is posterior followed by anterior, which were considered as central placental positions in present study[5].

Among 200 pregnant women with preeclampsia 88(44%) had centrally located placenta and 112(56%) had laterally located placenta, with P value 0.04 which is statistically significant, Out of 200 preeclampsia cases, 133 were mild preeclampsia out of which 59(44.36%) had central placenta, and 74(55.63%) had lateral placenta. And out of 200 cases of severe preeclampsia, 67 were severe preeclampsia, out of which 29(43.29%) had a central placenta, and 38(56.72%) had a lateral placenta. Similar results were observed in a study conducted by Ananya Priyadarshini et al., out of 48 patients of preeclampsia 33(68.75%) had lateral placenta, and 15 (31%) had centrally located placenta[6].

The current study is comparable to results obtained by Bhattacharjee et al., found among 100 cases of preeclampsia 64 cases had laterally located placenta, and 34 cases had centrally located placenta[4].

Hence chances of developing preeclampsia are more in laterally located placenta due to In laterally located placenta, the uteroplacental blood flow needs are to be met primarily by one of the uterine arteries with some contribution by the other uterine artery via collateral circulation. The degree of collateral contribution may not be the same in all women, and deficient contribution facilitates the development of preeclampsia.

7. Conclusion

From the above study, it is concluded that laterally located placenta on ultrasound is associated with increased risk of development of preeclampsia. 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. One of the major advantages of this study is it is not an extra test.

From the routine ultrasonography, the location of the placenta can be used to correlate with the development of preeclampsia.

References

[1] DC Dutta. Hypertensive disorders in pregnancy, chapter18: DC Dutta's Textbook of obstetrics, 9th ed, Hiralal Konar. Jaypee brothers medical publishers(p)Ltd, New Delhi; 2018:207-227.
[2] Cunningham, Leveno, Bloom, Dashe, Hoffman, Casey, et al. Hypertensive disorders, chapter 40: William's Obstetrics,25th ed, McGraw Hill Education, United States;2018:710-754.
[3] Sumathi N, Pavithra G.R, Placental laterality-A Simple yet reliable predictor of pre-eclampsia an ultrasonic prospective study, Journal of dental and medical sciences,2016 Oct;15(10):116-121.
[4] AK Bhattacharjee,MK Majumdar,B Lucky,placental laterality by ultrasound and its correlation to development of preeclampsia,sch.j.app.med.sci.,2017;5(10F):4197-4200.
[5] JB Sharma, Physiology of reproduction, chapter 3:JB Sharma Textbook of obstetrics, Avichal publishing company, Delhi:2018:14-24.
[6] P Ananya, U Purnima, N Ruchira, G Mamta, Placental location and development of the preeclampsia-A longitudinal study**,** Int J Reprod Contracept Obstet Gynecol. 2019 Apr;8(4):1789-2320.