PLACENTAL LATERALITY AS A PREDICTOR OF PREECLAMPSIA

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ABSTRACT

BACKGROUND

Hypertensive disorders continue to be a major cause of maternal and perinatal morbidity & mortality. In laterally located placenta, uteroplacental blood flow primarily depends upon ipsilateral uterine artery, which is a risk factor for development of preeclampsia. This study aims at determining the association between placental laterality and preeclampsia.

MATERIALS AND METHODS

Three hundred women with singleton pregnancy not having other medical & obstetric disorders are subjected to ultrasound at 18-24 weeks of gestation and followed up till term for development of preeclampsia.

RESULTS

Seventy six out of 300 women had lateral placenta of which 28 (36.84%) developed preeclampsia. Twenty seven (12.05%) out of 224 women having centrally located placenta had preeclampsia with a p value of <0.001 in χ^2 which is a statistically significant association.

CONCLUSION

Laterally located placenta is associated with 4 times increased risk of preeclampsia (Odds ratio 4.2). Hence, this can be used as a predictor of preeclampsia.

KEYWORDS

Preeclampsia, Lateral Placenta.

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BACKGROUND

Hypertensive disorder in pregnancy continues to be a major cause of maternal and perinatal mortality. They contributed to 15-20% of maternal and 20-25% of perinatal mortality.¹

Preeclampsia is a disease of trophoblastic tissue. It occurs only in the presence of placenta.¹ It is defined as rise of blood pressure $\geq 140/90$ mmHg recorded on two occasions 6 hours apart with proteinuria ≥ 0.3 g/24 hours urine sample after 20 weeks of gestation.¹

Over the years several tests have been proposed to identify women at risk of developing preeclampsia. Among the various predictors of preeclampsia, placental location by ultrasound at 18-24 weeks is very cost-effective, non-invasive and has a good positive predictive value.^{2,3}

In women with centrally located placenta, both uterine arteries demonstrate similar resistance. When placenta is laterally located, the uterine artery close to the placenta has lower resistance than the one opposite from it. 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 collaterals.^{4,5} The degree of collateral contribution may not be same in all women and deficient contribution facilitates development of preeclampsia, IUGR or both.^{6,7}

Hence, this study is designed to investigate the association between placental laterality and preeclampsia so that it may be used as a predictor of preeclampsia.

MATERIALS AND METHODS

This is a prospective study conducted on pregnant women who attended the antenatal clinic from May 2015 to Nov 2016.

Three hundred pregnant women with singleton pregnancy, willing for follow-up till term are randomly selected and placental location determined by ultrasound between 18 to 24 weeks of gestation. Patients having pre-existing medical disorders, uterine anomalies, history of smoking and any obstetric complication are excluded from the study.

In all the pregnant women included in the study, a written informed consent was obtained. A detailed history and clinical examination was carried out, blood pressure was measured in sitting posture. Location of placenta was determined by ultrasound at 18 - 24 weeks during anomaly scan.

Placenta is classified as central when it is equally distributed between the right and left sides of the uterus irrespective of anterior, posterior or fundal position. When 75% or more of the placental mass is to one side of the midline it was classified as lateral placentation.

Patients were followed up for development of preeclampsia which is diagnosed on the basis of American College of Obstetricians & Gynaecologists criteria i.e. new-onset hypertension $\geq 140/90$ mmHg occurring after 20 weeks of gestation with urinary excretion of ≥ 0.3 g protein/24 hours.

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Data analysis was done using SPSS software. Chi-square test was done to find out any significant statistical relation between the variables. Probability value of <0.005 was statistically significant.

RESULTS

Age (Yrs.)	Preeclampsia		Total	% of Preeclampsia
	Absent	Present		
< 20	10	4	14	28.5%
20-24	148	33	181	18.2%
25-29	67	14	81	17.2%
30-34	15	4	19	21.05%
>34	5	0	5	0%
Total	245	55	300	

Table 1. Incidence of Preeclampsia in Various Age Groups

Out of fourteen, 28.5% of patients in <20 yrs. age group developed preeclampsia, with chi-square value of 2.25 & p value of 0.689 which is statistically not significant.

Wt. (kg)	Preeclampsia		Total	% of Preeclampsia
	Absent	Present		
< 50	4	2	6	33%
50-59	32	13	45	29%
60-69	107	30	137	22%
70-79	90	8	98	8%
>79	12	2	14	14%
Total	245	55	300	

Table 2. Incidence of Preeclampsia in Various Weight Groups

Eight of patients of weight group 70-79 kg developed Preeclampsia, with chi-square value of 12.33 and P-value of 0.015 which is statistically not significant.

Gravida	Preeclampsia		Total	% of Preeclampsia
	Absent	Present		
1	126	29	155	18.7%
2	74	16	90	17.7%
3	32	6	38	15.7%
4	13	4	17	23.5%
Total	245	55	300	

Table 3. Distribution of Preeclampsia According to Obstetric Status

Among Primigravida 18.7% developed preeclampsia & 23.5% of gravida 4 developed preeclampsia.

Location of Placenta	Preeclampsia			
	Negative		Positive	
Central	197	87.95%	27	12.05%
Lateral	48	63.15%	28	36.85%
Total	245		55	
Chi - square				23.89
P - Value				<0.001

Table 4. Distribution of Placental Location and Preeclampsia

Out of 76 women having laterally located placenta, 28 (36.85%) developed PIH. Out of 224 women having centrally located placenta, 27 (12.05%) developed PIH with chi-square

value of 23.89 and p value of <0.001 which is statistically significant. So, the overall risk of developing preeclampsia with laterally located placenta is 4.2 (odds ratio).

DISCUSSION

The mean age of developing preeclampsia was 21 - 25 years. This result is comparable with Kakkar Tania et al.⁸

Incidence of preeclampsia in primigravida was 18.71% which is similar to the study by Long & Oates et al.⁶

In this study, the incidence of lateral placentation was 25.33% which is comparable to the study done by Alpesh Patel et al.⁹ Incidence of preeclampsia in patients with lateral placentation was 36.85% which is statistically significant with chi-square value 23.89 and P value <0.001.

Anuja V Bhalerao et al.⁶ studied 463 pregnant women with placental localisation and concluded that 73.23% patients with lateral placenta developed preeclampsia. Pai Muralidhar V et al.¹⁰ studied 426 antenatal women. Three hundred and twenty three had central placenta and 102 had unilateral placenta. A total of 71 women developed preeclampsia of which 52 (74%) had unilaterally located placenta at 20-24 weeks of gestation.

CONCLUSION

Laterally located placenta is associated with 4 times increased risk of developing preeclampsia. So these pregnancies require frequent checkup and careful obstetric management to decrease maternal and perinatal morbidity and mortality.

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