



Placental Laterality by Ultrasound- A Simple Yet Reliable Predictive Test for Pre Eclampsia

KEYWORDS

ultrasonography, PIH, pre eclampsia, placental location.

Dr.S.Venkata Ramana

Assistant Professor, Department of Obstetrics & Gynaecology KMC, Government General Hospital, Kurnool.

Dr.G.Padmaja

Assistant Professor, Department of Obstetrics & Gynaecology, Government general Hospital, Kurnool.

ABSTRACT Hypertensive disorders are among the commonest medical disorders during pregnancy. This is a prospective study conducted in our hospital to find out whether the lateral location of placenta as shown by ultrasound at 18-24 weeks of gestation can be used to predict the development of preeclampsia.

INTRODUCTION

Hypertensive disorders complicating pregnancy are common and form one of the deadly triad, along with haemorrhage and infection that contribute greatly to maternal morbidity and mortality¹. Hypertensive disorders complicate 5-20% pregnancies and cause 15-20% maternal mortality and 20-25% perinatal mortality. Studies have shown location of placenta may influence the uterine blood flow distribution and predispose the pregnancy to an adverse outcome like PIH.

The aim of the study is to evaluate relationship between placental location and occurrence of PIH. To study the incidence to PIH in patients with centrally located placenta and in those with laterally implanted placenta. To find out whether placental laterality as determined by ultrasound can be used as a predictor of development of pre-eclampsia.

Materials and methods

The study was conducted in the department of Obstetrics and Gynaecology, GGH, Kurnool medical college, Kurnool.

Inclusion criteria:

- Singleton pregnancy
- The location of placenta is determined at around 28-24 weeks of gestation by ultrasound.
- The placenta is classified as central when it is equally distributed between the right and the left side 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 is classified as unilateral right or left placenta.
- Exclusion criteria
- Multiple pregnancy or documented major congenital abnormality
- Chronic hypertensive patients, renal disease or collagen vascular disease.

Observation and results

Pregnancy induced hypertension

In this prospective study there were 100 singleton pregnant patients of whom 14 developed PIH.

I. Relation between gravidae and development of PIH

No of primigravidae are 9 (64.28%), second gravidae are 3(21.42%) and multigravidae are 2(14.28%).

II. Relation between placental location and development of PIH

Number of patients with central placenta is 3(21.42%), and number of patients with lateral placenta are 11(78.57%).

III. Relation between location of placenta and severity of PIH .

Number of patients with mild PIH is 6(42.85%), and number of patients with severe PIH is 8(57.14%) .

With central placenta, Mild PIH is 2(66.6%) and severe PIH is 1(33.33%). With lateral placenta, Mild PIH is 4(36.36%) and Severe PIH is 7(63.63%)

IV. Complication in relation to PIH & IUGR

Total number of patients who developed IUGR is 3(21.42%) With Central placenta IUGR is 1 (33.33%), Lateral placenta is 2(66.66%)

Number of Intrauterine foetal death with Central placenta is 1 (50%), and Lateral placenta is 1(50%).

Number of Abruptio placenta is 1(7.14%) with Lateral placenta

Number of patients with oligohydramnios is 2(14.28%). with Central placenta with oligos is 1(50%) with Lateral placenta it is 1(50%)

V. analysis of mode of delivery

Number of patients who had vaginal delivery 6(42.85%)

a) Central placenta with vaginal delivery :2 (33.33%)

b) Lateral placenta with vaginal delivery 4(66.66%)

Number of patients who underwent LSCS : 8(57.14%)

a) Central placenta with LSCS : 1(12.5%)

b) Lateral placenta with LSCS : 7(87.5%)

VI. Relation between neonatal outcomes based on Apgar scores

Number of babies with good Apgar score is 4 (44.44%), and with Central placenta is 1 (25%) and Lateral placenta is 3 (75%).

Number of babies with mild birth asphyxia is 4 (44.44%). Those with Central placenta is 1 (25%), and Lateral placenta is 3 (75%).

Number of babies with severe birth asphyxia is 1 (11.11%). Those with central placenta is 0, and with Lateral placenta is 1 (100%).

Number of induced preterm deliveries is 2, number of IUD is 2.

Number of abruptio placenta is 1, Intra partum eclampsia is 1.

VII. Relation between gravidae and placental location
Number of primigravidae are 9. With Central placenta it is 2 (22.22%), with Lateral placenta it is 7 (77.78%).

Number of second gravidae is 3. And those with central placenta is 1 (33.33%), and with lateral placenta is 2 (66.67%).

Number of multigravidae is 2, those with central placenta is 0 and with lateral placenta is 2 (100%).

VIII. Relation between severity of PIH and parity and location of placenta

Total No of patients with mild PIH-6						Total No of patients with severe PIH-8					
Primi Gravidae 3 (33.33%)		Second Gravidae 2 (66.66%)		Multi Gravidae 1 (50%)		Primi Gravidae 6 (66.66%)		Second Gravidae 1 (33.33%)		Multi Gravidae 1 (50%)	
Cen	Lat	Cen	Lat	Cen	Lat	Cen	Lat	Cen	Lat	Cen	Lat
1	2	1	1	0	1	1	5	0	1	0	1
33.33%	66.67%	50%	50%	100%	100%	16.67%	83.33%	100%	100%	100%	100%

IX. Relation between parity, location of placenta and complication of PIH.

Total number of patients who developed IUGR along with PIH-3

Number of primigravidae is 2 (66.6%) and with central placenta is zero and with lateral placenta are 2 (100%).

Number of second gravidae is 1 (33.33%), with central placenta is zero and with lateral placenta is 1 (100%).

X. Relation between parity, placental location and mode of delivery.

Vaginal delivery - 6						Lower segment cesarean section - 8					
Primi Gravidae 3 (33.33%)		Second Gravidae 2 (66.66%)		Multi Gravidae 1 (50%)		Primi Gravidae 6 (66.66%)		Second Gravidae 1 (33.33%)		Multi Gravidae 1 (50%)	
Cen	Lat	Cen	Lat	Cen	Lat	Cen	Lat	Cen	Lat	Cen	Lat
1	2	1	1	0	1	1	5	0	1	0	1
33.33%	66.67%	50%	50%	100%	100%	16.67%	83.33%	100%	100%	100%	100%

XI. Relation between parity, neonatal outcome and placental location:

Good Apgar - I						Mild Birth Asphyxia - I						Moderate Birth Asphyxia - I					
Primi Gravidae 3 (75%)		Second Gravidae 2 (50%)		Multi Gravidae 1 (25%)		Primi Gravidae 3 (75%)		Second Gravidae 1 (25%)		Multi Gravidae 0		Primi Gravidae 1 (100%)		Second Gravidae 0		Multi Gravidae 0	
Cen	Lat	Cen	Lat	Cen	Lat	Cen	Lat	Cen	Lat	Cen	Lat	Cen	Lat	Cen	Lat	Cen	Lat
1	2	1	0	0	0	0	3	0	1	0	0	0	0	0	0	0	0
33.33%	66.66%	100%				100%	100%	100%				100%					

Statistics for the patients without complication
Total number of control patients: 86

I. Relation of gravidae:

Number of primigravidae is 40 (46.5%), and second gravidae is 34 (39.5%), and multigravidae is 12 (13.95%)

II. Relationship of the placental location:

Number of patients with central placenta is 70 (81.39%) and number of patients with lateral placenta is 16 (18.6%)

III. Relation between parity and location of placenta

Number of primigravidae is 40 and with central placenta is 36 (90%) and with lateral placenta is 4 (10%)

Number of second gravidae is 34, with central placenta 28 (82.35%) and lateral placenta 6 (17.64%)

Number of multigravidae is 12, those with central placenta is 6 (50%), and with lateral placenta 6 (50%).

IV. Relation between mode of delivery, parity, location of placenta:

Spontaneous vaginal delivery 58 (74.4%)						LSCS = 28 (32.55%)					
Primi Gravidae 24 (41.37%)		Second Gravidae 24 (41.33%)		Multi Gravidae 10 (17.24%)		Primi Gravidae 16 (57.14%)		Second Gravidae 10 (35.71%)		Multi Gravidae 2 (7.14%)	
Cen	Lat	Cen	Lat	Cen	Lat	Cen	Lat	Cen	Lat	Cen	Lat
22	2	22	2	6	4	14	2	6	4		2
91.6%	8.3%	91.6%	8.3%	60%	40%	87.5%	12.5%	60%	40%		16.66%

DISCUSSION

1. Pre eclampsia 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 remain challenging.
2. In 1989, Kofinas et al² from north Carolina studied 300 pregnant women, of whom 153 women had no maternal complications while 147 had PIH/IUGR, to evaluate the association between placental location and development of PIH or IUGR. They found that in the presence of PIH, or IUGR, up to 75% of patients had laterally located placenta and 25% had central placenta.
3. In the present study, out of the total 100 singleton pregnant women, 14 developed Pre eclampsia, of these 11 (78.57%) had unilaterally located placenta whereas only 3 had centrally located placenta.

Chi square test -21.97

P < 0.001

In our study placental laterality as determined by ultrasound at 18-24 weeks as a screening test for development of pre eclampsia has sensitivity of 78.57%, specificity of 81.39%, positive predictive value of 40.74% and negative predictive value of 95.89%. It is very useful cost effective and easy to perform non-invasive test.

This study provides evidence of the existence of significant

association between placental laterality and presence of PIH, IUGR or both. It also appears that the placenta is located laterally in majority of patients of PIH, IUGR.

Summary and conclusion

- In this study there were 100 singleton pregnant patients of whom, 14 patients had PIH, and 86 patients did not have any maternal complications (control group).
- Among 14 patients who had PIH, 64.28% of them were primigravidae, 21.42% were secondgravidae while 14.28% were multigravidae.
- 21.42% of patients with central placenta had only mild PIH and only 33.33% with lateral placenta developed PIH.
- 66.66% of patients with central placenta had only mild PIH and only 33.33% severe PIH.
- 36.36% of patients with lateral placenta had mild PIH while 66.66% had severe PIH.
- The incidence of complications of PIH like IUGR, was also more when PIH developed with laterally implanted placenta compared to the central one (66.66% vs. 33.33%).
- All these show that there is a significant association between the site of implantation of the placenta and development of PIH. The severity and complications of PIH also seem to be more with a laterally implanted placenta.
- 77.73% of primigravidae, 66.67% of secondgravidae and 100% of multigravidae who had a lateral placenta developed PIH.
- The incidence of IUGR is more with lateral placenta 66.66%.
- 66.66% of primigravidae who had to undergo lower segment caesarean section, of whom 83.33% had a laterally implanted placenta.
- On analyzing the neonatal outcome based on Apgar score too, more number of patients with a laterally implanted placenta had mild to moderate birth asphyxia.
- Two patients had IUD and one had abruptio placenta, two of the three had lateral placenta. 86 patients were normotensive, 81.39% of them had central placenta showing clearly that central placental implantation is less prone for complications.
- Thus the site of implantation of placenta does play a role in determining an uneventful pregnancy and outcome.
- Based on the above study as P value <0.001 is highly significant, the detection of laterality of placenta on ultrasound around 18-24 weeks of gestation can be considered as a reliable predictor of Pre eclampsia
- The sonologist who is doing anomalous scan around 18-24 weeks of gestation should look for location of placenta also and if it is found to be located laterally, the patient should be cautioned about PIH.
- The study provides evidence of the existence of a significant association between placental laterality and presence of PIH, IUGR or both.