Original Article

Indian Journal of Obstetrics and Gynecology
Volume 10 Number 2, April – June 2022
DOI: http://dx.doi.org/10.21088/ijog.2321.1636.10222.9

Uterine Artery Doppler At 11-14 weeks in Prediction of Preeclampsia

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How to cite this article:
G Soruba Rani, K Padma, Nancy F/Uterine Artery Doppler At 11-14 weeks in Prediction of Preeclampsia/Indian J Obstet Gynecol. 2022;10(2):85–90.

Abstract

Identification of women at high risk for preeclampsia improves pregnancy outcome, early prediction of preeclampsia prevents dreadful maternal complication thereby reduces maternal mortality & morbidity and fetal complication. A prospective study conducted in Govt. Rajaji Hospital Madurai from January 2021 – September 2021. 300 antenatal women were interrogated between 11-14 weeks of GA with uterine artery Doppler. Out of which 55.3% of High risk women were predicted as preeclampsia & 27% of low risk women were predicted as preeclampsia. These patients were treated with T.Aspirin. So that maternal & perinatal morbidity & mortality reduced.

Keywords: Preeclampsia; IUGR; Uterine Artery Doppler.

Introduction

Preeclampsia affects 5 to 8% of pregnant women, is the most frequent medical complication in pregnancy and the most important cause of maternal and perinatal morbidity and mortality. Incidence is rising as women are postponing their pregnancy to a later age and increased prepregnancy weight. The initial pathological changes begin in late first trimester and consist of abnormal remodeling of the spiral arteries. At severe end of spectrum, preeclampsia can result in pulmonary edema, cerebral hemorrhage, hepatic failure, renal failure, eclampsia, disseminated intravascular coagulation and maternal death. Fetal/neonatal consequences include growth restriction preterm birth, stillbirth, and admission to a neonatal intensive care unit. Abnormal invasion of the placental trophoblast into the maternalspiral arterioles, as early as the first trimester, is the proposed pathophysiologic mechanism for the development of this disorder. This abnormal placentation results in a high resistance uteroplacental circulation bed and persistent placental underperfusion, leading to the phenotype of preeclampsia.

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Received on: 03.12.2021

Accepted on: 04.01.2022

Materials and Methods

This is a prospective study conducted for the period of 9 months from jan 2021 Sep 2021. This study includes 300 antenatal women at 11-14 weeks, singleton pregnancy. They were interrogated, examined & investigated. Through history taking to know the patient demographics, GA & to know

any high risk factors associated with the pregnancy like family history of HT, diabetes, ch.renal failure, SLE. Routine biochemical investigation & ultra sound Doppler study were done. Those cases with increased resistance index or diastolic notching were asked to attend antenatal clinic once in 15 days.

Results

Among 300 randomly selected antenatal cases, low risk women contributes 84.7%, and high risk women contributes 15.3%. Among 300 antenatal cases in whom Uterine artery Doppler study at 11-14 weeks was done, 18% had abnormal uterine artery Doppler.

Discussions

Among 300 randomly selected antenatal cases, low risk women contributes 84.7%, and high risk women contributes 15.3%. Among 300 antenatal cases in whom Uterine artery Doppler study at 11-14 weeks was done, 18% had abnormal uterine artery Doppler.

Low Risk: 12.9% had abnormal Doppler. 27.3% of low risk women with abnormal Doppler had preeclampsia.

High Risk: 75% of women with age > 30yrs had preeclampsia. 31.25% of Overweight women with BMI 25 to 30 had preeclampsia. 66% of obese women with BMI>30 had preeclampsia. 36% of primi with abnormal Doppler had preeclampsia. 32% of multi with abnormal Doppler had preeclampsia. 55% of women with previous history of preeclampsia. 50% of women with family h/o hypertension had preeclampsia. 50% of women with diabetes mellitus had preeclampsia. 40.7% of women early diastolic notch at 11 to 14 weeks developed preeclampsia. 47.4% of women with persistent diastolic notch at 20 weeks had preeclampsia.

Resistance Index

Resistance index reference value is 0.7 for 11 to 14 weeks. 38% of women with Resistance index >95 thpercentile developed preeclampsia. So, elderly women, primi gravidae, obese women, women with previous history of preeclampsia, family history of hypertension, Diabetes mellitus are more prone to develop preeclampsia, which can be detected earlier by uterine artery Doppler at 11-14 weeks.

Conclusion

Uterine artery Doppler at 11-14 weeks should be done in all cases atleast in high risk cases so that maternal and perinatal morbidity and mortality may be reduced. During 11-14 weeks nuchal translucency USG done to rule out chromosomal abnormality along with that uterine artery Doppler study should also be added for better maternal and Perinatal outcome.

Table 1: Doppler Abnormality.

Doppler	No. of Cases	Percentage
Abnormal	61	20.3
Normal	239	79.7
Total	300	100

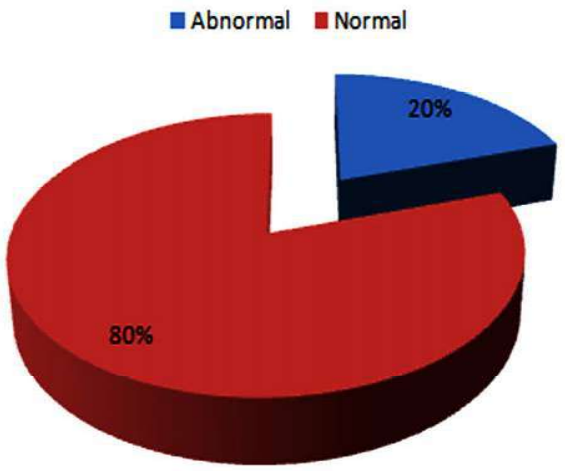

Fig. 1: Doppler Result

Table 2: Age Vs Abnormal Doppler Vs Preeclampsia

Age	No of Cases			Percentage		
	Abnormal Doppler	Pet	Iugr	Abnormal Doppler	Pet	Iugr
<19 (13)	6	2.0	5	46.2	33.3	83.3
20–30 (276)	51	16.0	19	18.5	31.4	37.3
>30 (11)	4	3.0	2	36.4	75.0	66.7
Total	61	21.0	26	–	–	–

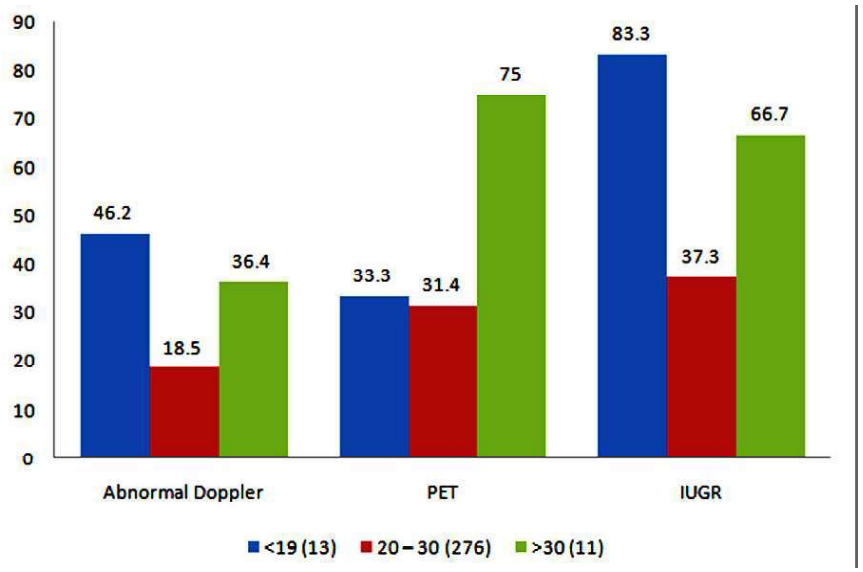

Fig. 2: Age Vs Abnormal Doppler.

Table 3: Bmi Vs Abnormal Doppler Vs Preeclampsia

BMI	No of Cases			Percentage		
	Abnormal Doppler	Pet	Iugr	Abnormal Doppler	Pet	Iugr
<24.9 (185)	26	8.0	12	14.1	30.8	46.2
25 – 29.9 (109)	32	10.0	13	29.3	31.3	40.6
>30 (6)	3	2.0	1	50	66.7	33.3

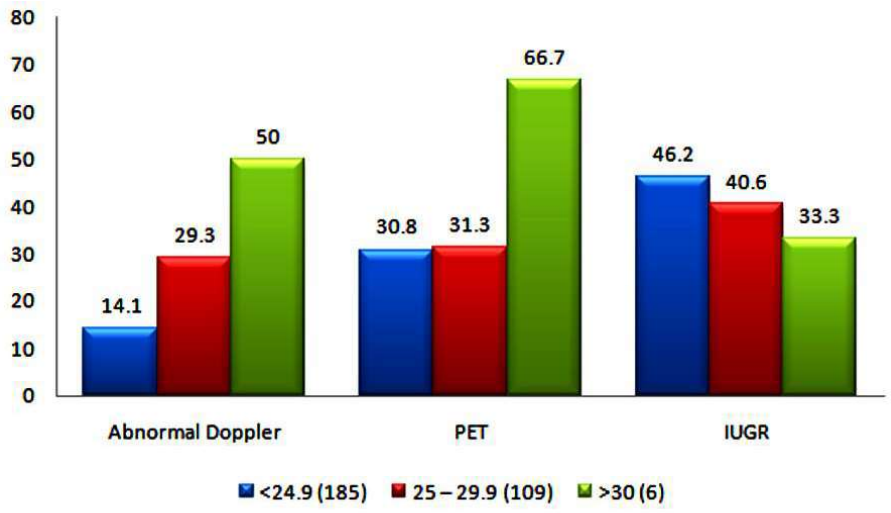

Fig. 3: Bmi Vs Abnormal Doppler

Table 4: Obstetric Code Vs Abnormal Doppler Vs Preeclampsia

Obst. Code	No of Cases			Percentage		
	Abnormal Doppler	PET	IUGR	Abnormal Doppler	PET	IUGR
Primi (164)	33	12.0	18	20.1	36.4	54.5
Multi (136)	28	9.0	8	20.6	32.1	28.5
Total	61	21.0	26	–	–	–

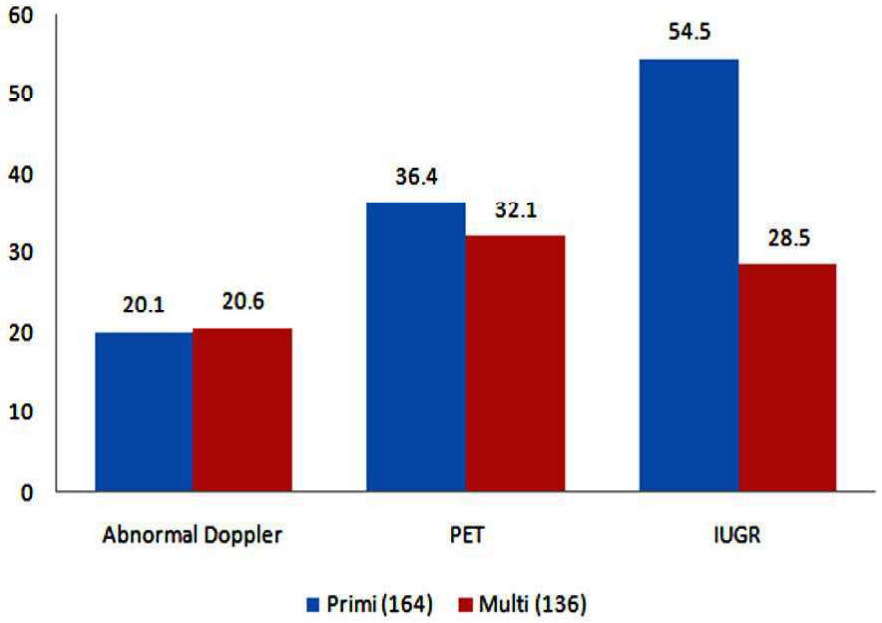

Fig. 4: Obstetric Code Vs Abnormal Doppler

Table 5: Risk Factors Vs Abnormal Doppler Vs Preeclampsia

	No of Cases			Percentage	
Risk Factors	**Abnormal Doppler**	**PET**	**IUGR**	**PET**	**IUGR**
Family H/o. HT	4	2.0	2	50.0	50.0
GDM	4	2.0	–	50.0	0.0
Prev. PP Elcampsia	1	0.0	–	0.0	0.0
Prev. GHT	9	5.0	2	55.5	22.2
Total	18	9.0	4	–	–

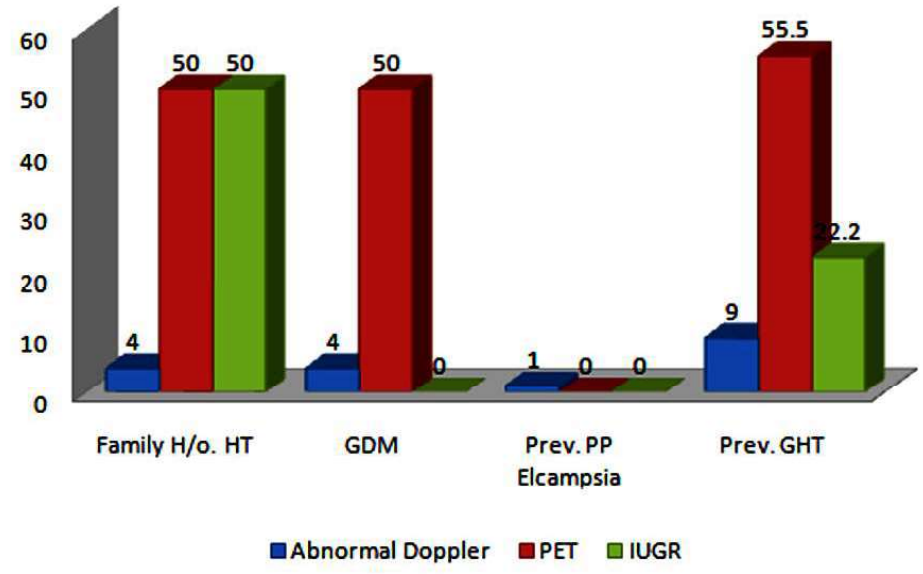

Fig. 5: Risk Factor Vs Abnormal Doppler

Table 6: Notch Vs Abnormal Doppler Vs Preeclampsia.

	Diastolic Notch	PET	IUGR	Diastolic Notch	PET	IUGR
Laterality						
Right	35	13.0	16	70	37.1	45.7
Left	15	6.0	10	30	40.0	66.6
Bilateral[4]	2	2.0	2	50	50.0	50.0

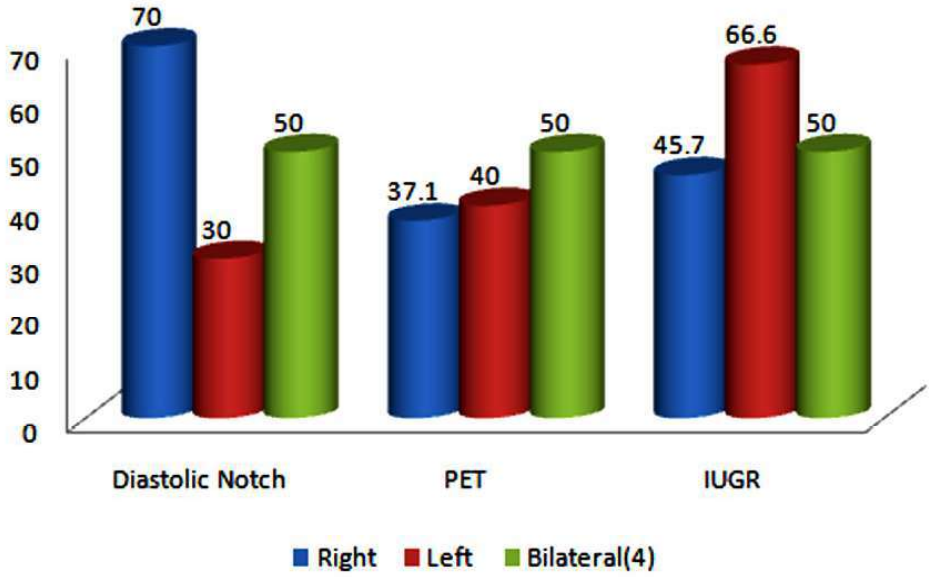

Fig. 6: Unilateral.

Table 7: Mean Ri

Mean RI	No. of Cases	Percentage
> 0.66	10	38.0
< 0.66	16	62.0
Total	26	100.0

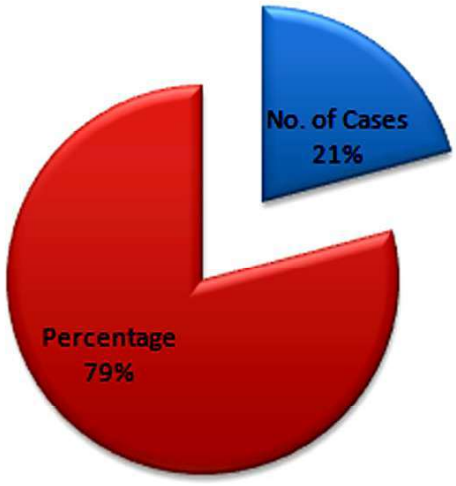

Fig. 7: Mean Ri.

Table 8: Persistence Notch at 20 weeks

Persistence Notch at 20 weeks	Diastolic Notch %	PET	IUCR
Right	71.4	48.0	60.0
Left	86.6	46.2	61.5

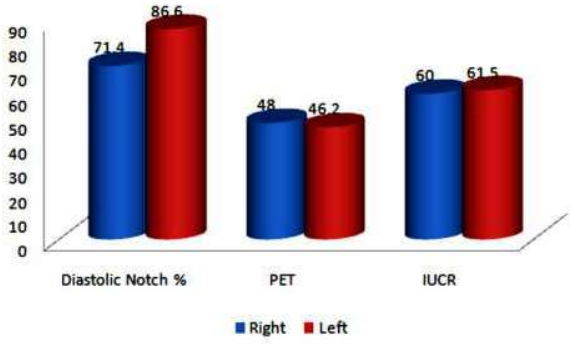

Fig. 8: Persistence of Diastolic Notch of 20 weeks.

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