

Role of Uterine Artery Doppler in Prediction of Pre Eclampsia And Its Foetal Outcome

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Abstract:

Introduction: Preeclampsia during pregnancy is one of the major risk factors for maternal and fetal mortality in developing countries. After implantation in the uterine cavity, the arterial system that irrigates the endometrium and myometrium undergoes a series of changes which lead to the uteroplacental circulation. Such changes in the arterial system are a result of the deciduas invasion by the trophoblast. So uterine artery Doppler has become common in evaluation and management of pregnancy associated complication like fetal growth restriction. **Aim:** To know the role of Doppler study in prediction of preeclampsia and its outcome on maternal and fetal risk factors. **Materials And Methods:** 55 pregnant women who were more than 18 weeks included into study, with risk factors like family history of hypertension and previous history of preeclampsia, eclampsia, abruption, twins, etc except with women who were chronic hypertension and less than 18 weeks not included in the study and was done in Department of OBG at Dr B R Ambedkar Medical College and Hospital, Bangalore. **Result:** Out of 55 women, 25 women developed preeclampsia in our study. 20 women has previous h/o of preeclampsia and 15 women had family h/o of hypertension. 5 women had abruption, 4 still birth and 11 fetal growth restriction in our study. **Conclusion :** Early prediction of preeclampsia helps in early intervention to prevent further complication on both. So Doppler study should be included in routine antenatal care to avoid these complication during pregnancy.

Key words: Doppler, Preeclampsia, Fetal growth restriction, Pph

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I. Introduction

Uteroplacental circulation by Doppler Ultrasound was first studied by Campbell[1] Most of the studies are based on alterations in uterine artery wave form, mainly the presence of bilateral diastolic notching with the onset of complications. Commonly the Doppler studies done for notching, pulsatility index and Resistance Index in uterine artery[2] Hypertensive disorders associated with 5-10% of all pregnancies and contribute about 20% of maternal mortality[3] Its is a progressive disease and finally it stop only after delivery of placenta, so early diagnosis and appropriate management may improve the outcome of mother and fetus. As per WHO 16% of maternal deaths were due to hypertensive disease and which are preventable[4].

II. Material & Methods

The present study was done in Department of OBG at Dr B R Ambedkar Medical College & Hospital, Bangalore, between November 2018 to September 2019. 55 antenatal cases were enrolled into the study who were more than 18 weeks of pregnancy and who had risk factors for developing preeclampsia after taking consent. Women who were less than 18 weeks not included and also with chronic hypertension

III. Observations

In this study 55 pregnant women enrolled into the study after taking all criteria into account who were above 18 weeks of pregnancy.

| Age | No of cases | Percent |
|------------|-------------|---------|
| 18- 20 yrs | 15 | 27.27 |
| 21-29 yrs | 25 | 45.45 |
| >30 yrs | 15 | 27.27 |
| Total | 55 | 100 |

Table No 1. Age wise distribution of cases

| Parity | No of cases | percent |
|----------|-------------|---------|
| G1 | 22 | 40.01 |
| G2 | 23 | 41.81 |
| G3 &more | 10 | 18.18 |
| Total | 55 | 100 |

Table No 2. Parity wise distribution of cases

| H/o preeclampsia | No of cases | percent |
|------------------|-------------|---------|
| Yes | 20 | 36.36 |
| No | 35 | 63.63 |
| Total | 55 | 100 |

Table No 3. Past history of preeclampsia wise

| Family h/o preeclampsia | No of cases | percent |
|-------------------------|-------------|---------|
| Yes | 15 | 27.27 |
| No | 40 | 72.72 |
| Total | 55 | 100 |

Table No 4 . Family history of preeclampsia

| Doppler(Notching change) | No of cases | percent |
|--------------------------|-------------|---------|
| Yes | 25 | 45.45 |
| No | 30 | 54.54 |
| Total | 55 | 100 |

Table No 5. Notching changes during Doppler study

| Pulsatility Index | No of cases | percent |
|------------------------------|-------------|---------|
| >90 th percentile | 25 | 45.45 |
| Normal | 30 | 54.54 |
| Total | 55 | 100 |

Table No 6. Pulsatility Index changes during Doppler study

| Development of preeclampsia | No of cases | percent |
|-----------------------------|-------------|---------|
| Yes | 25 | 45.45 |
| No | 30 | 54.54 |
| Total | 55 | 100 |

Table No 7. Development of Preeclampsia

IV. Discussion

Our study is based on the fact that Uterine artery Doppler-bilateral diastolic notching and pulsatility Index can be used as a screening test, before the disease set in.

In this study, maximum number of women belongs to 21-29yrs(45.45%) as compared to other study were more women were belong to 20-35yrs[5] In this study, Primi gravida were 22 women and 23 women were second gravid. Out of these 11 women developed preeclampsia who were primigravida and 9 women who were second gravid who developed preeclampsia, as compared to other study, were 19 and 11 women respectively[6]

In this study, about 14% have past history of preeclampsia in first pregnancy as compared to other study were its 8% had past history who developed preeclampsia[7] So from our study we can conclude that if a women had past history of preeclampsia, then she is more likely to develop same complication in present pregnancy also.

In this study, about 9 women who developed preeclampsia had family history of preeclampsia as compared to other study 7 women had same history[8]

So uterine artery Doppler(notching) has sensitivity of 98.6% and specificity of 86.2%. Pulsatility index has sensitivity of 85.5% and negative predictive value of 98.2%. Doppler is said to be abnormal when S/D ratio greater than 2.6. During non pregnant state some study shows that there is rise and fall in uterine artery flow velocity during systole and a notch in descending wave form in early diastole[9]

V. Conclusion

Early prediction of preeclampsia helps in early intervention and prevention of morbidity and mortality. So Doppler study should be included in routine care during antenatal visit. Uterine artery indices like notching and pulsatility index can be used as a predictor during pregnancy.

The recent management option explored the various modalities in prediction and prevention of this disease. However, the only effective therapy is the delivery of the fetus and placenta. The risks associated with this disease is like preterm, IUD, placental abruption, HELLP syndrome etc, all these complication is because of faulty trophoblastic invasion of spiral arteries.

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