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Original Research Article

To conclude whether a Doppler study of uterine artery for diastolic notch can be an effective screening test for prediction of PIH and IUGR.

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Abstract:
Background & Method: The aim of the study is to conclude whether a Doppler study of uterine artery for diastolic notch can be an effective screening test for prediction of PIH and IUGR. Patients was diagnosed to have PIH if there was a rise in systolic pressure of at least 30 mmHg or a diastolic of at least 15 mmHg over the previously known blood pressure or an absolute rise in the blood pressure of at least 140/90 mmHg was taken to diagnose women as a case of PIH.
Result: In the study, there were 50 primigravida out of which 35 were low risk, 15 were high risk and 50 multigravidae, all were high risk. In the present study 60% high risk cases delivered normally, 18% cases delivered preterm or 6% aborted, LSCS was done in 16% cases.
Conclusion: Study included low risk primigravida 35% and high risk primigravida and multigravidae with risk factors 65%. Maximum no. of screen positive cases was in between 21-25 yrs, screen positivity was 47%. PIH and IUGR remains a challenge to obstetrician, having ill-defined pathogenesis and therefore no definitive treatment to prevent its progression. Various methods have been acclaimed for identifying pregnant women at risk of development of PIH and IUGR but none of those predict it. Therefore there has been need of a method, which can predict future development of PIH by mid of pregnancy. Many authors lately studied uterine artery waveform to predict PIH and IUGR.

Keywords: Doppler, uterine artery, diastolic, PIH and IUGR.

Study Designed: Observational Study.

1. Introduction

Earliest mention of the hypertensive disorder of pregnancy was made by Hippocrates. He subscribed to the theory of 4 humors to describe the cause of illness and disease. He thought that headache, drowsiness and convulsions were of serious significance in pregnant women. In fact the word 'Eclampsia', is a Greek word, meaning 'sudden flash' or 'sudden fever' and the name was given by Hippocrates to this disease of sudden onset[1].
Ancient Egyptian and Chinese literatures mention danger or convulsions in pregnancy. The ancient Indians knew about toxemia and its effects on pregnancy and used to give an

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unfavorable prognosis if a pregnant woman had dropsy[2]. As stated by Gorden, eclampsia sepsis and postpartum hemorrhage were rare in ancient Indian women.
The human embryo undergoes interstitial implantation by invading the maternal decidua at the blastocyst stage.[11] Differentiation of the trophectoderm yields multiple cell lineages, including extravillous trophoblasts, which invade maternal spiral vessels to form a hemochorial placenta in which fetal trophoblasts are bathed directly by maternal blood[3]. However, maternal blood flow in the spiral vessels is initially limited by endovascular plugs and early placental development occurs in a state of hypoxia with nutrients supplied by secretions from endometrial glands called histiotrophs[4].
Loss of the endovascular plugs after 10 to 12 weeks results in a transition to a condition where maternal blood circulates through the intervillous space. It is noteworthy that the onset of blood flow is not random, but a well-orchestrated progressive periphery to center phenomenon[5]. The invasion of the maternal vasculature by extravillous trophoblasts replaces the smooth muscle normally present in the spiral arterioles with a non-contractile matrix[6].

2. Material & Method

The present observational study was conducted from March 2022 to March 2023. Pregnant women attending the antenatal clinics, screened for possible participation in the present study after explaining the nature of the study. A patient was diagnosed to have PIH if there was a rise in systolic pressure of at least 30 mmHg or a diastolic of at least 15 mmHg over the previously known blood pressure or an absolute rise in the blood pressure of at least 140/90 mmHg was taken to diagnose women as a case of PIH.

Inclusion criteria:

Selected women between 16-28 weeks of gestation with following high risk factor were enrolled.

Selection Criteria:

1. Primigravida.
2. Primi / multi gravidae with other risk factors –
3. Essential hypertension, obesity, renal disorder, anaemia

3. Results

Table 1: Distribution according to gravidity and risk

Gravidity	Low Risk	High Risk	Total
Primi	35	15	50
Multi	0	50	50
Total	35 (35%)	65 (65%)	100

In the study, there were 50 prmigravidae out of which 35 were low risk, 15 were high risk and 50 multigravidae, all were high risk.

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Table 2: Distribution of cases according to age group

Age (years)	No. of cases	
	No.	%
16-20	21	21%
21-25	47	47%
26-30	28	28%
31-35	4	4%

Present study shows maximum number (47%) cases were between the age group of 21-25 yrs.

Table 3: Distribution of screen positive cases according to age group

Age (years)	No. of cases	Screen Positive Case (n=22)	
	No.	No.	%
16-20	21	4	18.188%
21-25	47	11	50.00%
26-30	28	5	22.72%
31-35	4	2	9.09%

Maximum number of screen positive cases also belong to same age group of 21-25 yrs.

Table 4: Distribution of case according to mode of delivery

Mode of delivery	No.	Percentage
Normal labour	60	60%
Preterm labour	16	16%
Abortion	6	6%
LSCS	16	16%
Twin Delivery	1	1%
Assisted breech delivery	1	1%

In the present study 60% high risk cases delivered normally, 18% cases delivered preterm or 6% aborted, LSCS was done in 16% cases.

4. Discussion

In our study, 100 antenatal cases with different high risk for development of PIH were studied. Which included 50 primigravida and 50 multigravidae. Out of all primigravida, 35% cases of low risk, while all multigravidae were high risk. There were 35% of primigravida

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and 65% of high risk primi and multigravidae (with risk factors for PIH). Caforio (1999) in his study studied 38.76% high risk and 61.27% low risk. In Soregaroli's (2001) study, all cases were of high risk, Backer (2002) studied 7508 singleton low risk pregnant women. (2011) Moh. Khalid et al took 37.93% high risk and 62.06% low risk pts[7].

Caforio (1999) found 100% and 94% diastolic notch positivity in low and high risk pregnancies. Bushan (1999) in his study found, pre-eclampsia is more common during first pregnancy, 5-10% in twins / triplets, in very young/ elder women and multigravidae with history of PIH (7%). Harington (1996) found sensitivity of notching for prediction of PIH (76.9%) in primigravida and (77.76%) in multigravidae. Becker (2000) showed prevalence of notch 8.5% in nullipara and 4.7% in multipara[8]. In our study they were 28% and 16% respectively. Similarly our study confirms, primigravidity as an individual risk factor for development of PIH but association with other risk factors increased the risk to all most double[9].

In our study, teenage pregnancies (16-20 yrs) were 21%, out of which 18.18% were screen positive. 47% cases were in between of age group of 21-25 yrs out of which 50% were screen positive. 28% cases were in between 25-30 yrs out of which 22.18% were screen positive. 4% cases were in between 31-35 yrs out of which 9.09% case were screen positive[10&11]. More number of screen positivity in <25 year of age is because of more number of primigravida and history of PIH in this age group and teenage pregnancies are more liable to develop PIH[12]. Ali BS et al (2004) in their study have found that majority of preeclampsia and eclampsia pts were of young age[13].

5. Conclusion

Study included low risk primigravida 35% and high risk primigravida and multigravidae with risk factors 65%. Maximum no. of screen positive cases was in between 21-25 yrs, screen positivity was 47%. PIH and IUGR remains a challenge to obstetrician, having ill-defined pathogenesis and therefore no definitive treatment to prevent its progression. Various methods have been acclaimed for identifying pregnant women at risk of development of PIH and IUGR but none of those predict it. Therefore there has been need of a method, which can predict future development of PIH by mid of pregnancy. Many authors lately studied uterine artery waveform to predict PIH and IUGR.

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