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## Original Research Article

## High risk pregnancies and implications of color Doppler

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## ABSTRACT

**Background & Method:** The aim of this study is High risk pregnancies & implications of color Doppler. Total 100 were selected with purposive sampling technique, (50 cases) study group of high risk pregnancy taken into the study & compared with an equal number of women with normal pregnancy without complication.

**Result:** In our study we found, maximum cases in age group of 24-34 i.e. 49% in group A whereas in group B 43% in more than 34 age group. 41% normal in group A whereas 27% in group B. C-section 79% in group a & 21% in group B. Emergency caesarean section was uncommon in subjects with normal Doppler USG than those of with abnormal Doppler USG and also from group B.

**Conclusion:** In high risk women like pre eclampsia, diabetes & IUGR. Color Doppler flow velocimetry done repeatedly can predict address foetal events with a great degree of accuracy. Results obtained in study where clinically & statistically significant. Every tertiary hospital should routinely make use of facility for the assessment of fetal wellbeing in high risk cases & ensure a better perinatal outcome.

Color Doppler can be used as most effective for fetal surveillance in high risk pregnancy cases. Most importantly it helps in guiding early intervention and outcome.

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## 1. Introduction

Pregnancy can be considered as the most beautiful Period of a woman's life. The pregnancy is continuously observed by clinical examination, laboratory investigations and radio graphic examinations at exact intervals through its course.<sup>1</sup>

In obstetrics, the use of doppler ultrasound is to Study blood flow to assess fetal inaccessibility. Noninvasive investigation of feted circulation has become possible with the use of doppler as abnormal fetal circulation is considered a major factor in fetal growth restrictions.<sup>2</sup> Major cause of high risk pregnancies are pregnancy induced hypertension (PIH) or gestations hypertensions being one of the most

common. Considering the above facts the present study in high risk pregnancy and to correlate the finding of doppler with clinical finding in high-risk pregnant women.<sup>3,4</sup>

## 2. Materials and Methods

Total 100 were selected with purposive sampling technique, (50 cases) study group of high risk pregnancy taken into the study & compared with an equal number of women with normal pregnancy without complication. The color Doppler wave form of MCA umbilical artery was done for all cases b/w 28 to 37 weeks of gestation in both the groups.

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### 2.1. Place & duration of study

Suryanagri hospital, Jodhpur, Rajasthan. One year (2019-2020).

### 2.2. Inclusion criteria

Women with gestational age greater than 34 weeks with risk factors like Anemia, Hypertensive Disorders in Pregnancy, GDM, Multiple pregnancies, IUGR, cardiac disease etc.

### 2.3. Exclusion criteria

Pregnancies with gestational age less than 34 weeks, post dated pregnancies etc.

## 3. Results

**Table 1:** Socio-demographic data

Variables Group A,	Variables Group An =100 (%)	Variables Group B,n =100 (%)	P -value
Demography age groups in years			
<24	14	27	0.023
24-34	48	30	
>34	37	44	
Parity			
Primipara	13	21	0.039
Multipara	87	79	
Consanguinity			
Yes	21	13	0.97
No	79	87	

**Table 2:** Maternal & fetal clinical profile & outcome

Variables Group A,	Variables Group An =100 (%)	Variables Group B,n =100 (%)	P -value	
Amniotic fluid				
Normal	41	73	0.0283	
Poly/oligohydromnios	59	27		
Labor induction				
Yes	15	09	0.22	
Mode of delivery				
C-section	79	21	0.69	
Gestational age				
Pre-term	39	26		
Normal	88	94	0.0471	
Placenta				
Abnormal location	11	06		
Calcified	01	00		

## 4. Discussion

In our study, it has conclusively proved that the resistance index in the MCA steadily declined as compared to the study

**Table 3:** Risk of emergency caesarean section with relation to Doppler findings

Variables	Emergency C-section	P -value
Risk of emergency C-section in Group A (normal Doppler vs. abnormal Doppler)		
Normal Doppler	30	0.32008
Abnormal Doppler	13	
Risk of emergency C-section (normal Doppler in group A vs. group B without Doppler)		
Normal Doppler	32	
Group B with C-section	61	
Risk of emergency C-section (abnormal Doppler in group A vs. group B without Doppler)		
Abnormal Doppler with C-section	14	
Group B with C-section	63	

group from 28-36 weeks.<sup>5</sup> When the maximum incidence of IUD is reported. Our study also shows that the A/B ratio in the MCA was the highest around 28 weeks of gestation & fall of A/B ratio is present up to term to facilitate increase blood flow. But this fall is statistically less than that of control group.<sup>6</sup> The MCA pulsatility index also showed a high at around 28 weeks with a study decline up to term which is significantly less than that of controls. The umbilical artery blood flow studies show that the peak.<sup>7</sup> PI levels are at 30 weeks of gestation with a study decline & at 36 weeks there is a rise showing that there is resistance to blood flow as compared to control group & there is steady decline at term. The pulsatility index in the high-risk group as showed steady decline up to 6 weeks & rise nearing term.<sup>2</sup> The A/B ratio in study group at around 30 weeks & study decline at 36 weeks & an abrupt ripe at term. In the control group the mean. A/B ratio steady decline in with minimum values at term.

Doppler measurements can be obtained from the umbilical artery (UA), middle cerebral artery (MCA), ductus venosus (DV) and uterine arteries. The pulsatility index (PI) and resistance index (RI) are used for the arteries and the peak velocity index (PVI) is used for the veins. Abnormal umbilical artery Doppler flow velocimetry is defined as a pulsatility index (PI) >2 standard deviations (SD) above the mean for gestational age and / or absence or reversal of end-diastolic flow. Umbilical artery Doppler reflects downstream placental vascular resistance, correlated with intrauterine growth restriction and the multisystem effects of placental deficiency. Abnormalities are progressive, with reduction, loss and finally a reversal of diastolic flow. When blood flow in the umbilical arteries become abnormal, the differentiation of fetus status requires

Doppler information from systemic vessels, as middle cerebral artery and ductus venosus. The middle cerebral artery is the vessel of choice to assess the fetal cerebral circulation because it is easy to identify.<sup>2</sup> When the fetus is hypoxic, the cerebral arteries tend to become dilated in order to preserve the blood flow to the brain. In the middle cerebral artery, the systolic to diastolic (A/B) ratio will decrease (due to an increase in diastolic flow) in the presence of chronic hypoxic insult to the fetus. This increase in blood flow can be evidenced by Doppler ultrasound of the middle cerebral artery. This effect has been called "brain sparing effect" and is demonstrated by a lower value of the pulsatility index. In fetuses with intrauterine growth restriction (IUGR) a pulsatility index below the normal range indicates a greater risk of adverse perinatal outcome. The brain sparing effect may be temporary, as reported during prolonged hypoxemia in animal experiments, and the overstressed human fetus can also lose the brain sparing effect. The disappearance of the brain sparing effect is a critical event for the fetus, and appears to precede fetal death.<sup>8</sup>

Doppler ultrasound of the umbilical artery is more helpful than other tests of fetal wellbeing, namely cardiotocography and biophysical profile score in distinguishing between the normal small fetus and the 'sick' small fetus.

The effects of Doppler ultrasound in high-risk pregnancies on obstetrical care and fetal outcomes were systematically reviewed (Neilson 2003).<sup>9</sup> The use of Doppler in pregnancies complicated by hypertension or presumed impaired fetal growth was associated with a trend in reduction of perinatal deaths.

## 5. Conclusion

Assessment of fetal well-being in high risk pregnancies is done by a variety of methods includes NST, biophysical profile & daily fetal movement count (DFMC). The positive predictive value for assessment of fetal Doppler flow velocimetry has revolutionized the diagnosis of abnormal blood flow the foeto-placental bed, & early identification of these abnormal patterns are useful in the determining the optimal time for delivery to reduce the perinatal mortality.

In high risk women like pre eclampsia, diabetes & IUGR. Color Doppler flow velocimetry done repeatedly can predict address foetal events with a great degree of accuracy. Results obtained in study where clinically & statistically

significant. Every tertiary hospital should routinely make use of facility for the assessment of fetal well-being in high risk cases & ensure a better perinatal outcome.

## 6. Source of Funding

None.

## 7. Conflict of Interest

None.

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