

PREDICTON OF FETAL DISTRESS WITH CEREBRO - PLACENTAL RATIO

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ABSTRACT

OBJECTIVE: The intention of our examine is to evaluate the usefulness of cerebro-placental ratio that is the ratio of the fetal middle cerebral artery(MCA) PI to the Umbilical Artery PI in the prediction of fetal heart rate decelerations(fetal distress). **MATERIALS AND METHODS:** This is a observational correlational examine conducted from 120 antenatal patients with severe oligohydramnios accompanied up with color Doppler evaluation of cerebro-placental ratio and followed up till delivery for any fetal distress.**RESULTS:** Of the 120 patients in the observe, 32 sufferers showed odd C/U ratio (<1.08), all had adverse perinatal final results in the form of IUGR, preterm, low apgar, NICU and postnatal demise.**CONCLUSION:** AFI < 5 cm in third trimester of pregnancy with abnormal CPR are related to unfavorable effects in the intra-partum and post-partum period. Among the fetal MCA Doppler indices, the cerebro-placental ratio has the very best sensitivity, specificity, positive and negative predictive values with an accuracy of 56.67 % in identifying unfavourable consequences.

Keywords: Middle cerebral artery to umbilical artery pulsatility ratio, cerebro placental ratio, fetal distress, LSCS, NICU

1.INTRODUCTION

Color Doppler evaluation is the non invasive method of surveillance of fetal hypoxemia in high risk pregnant mothers. Doppler ultrasound velocimetry of utero placental, umbilical and fetal vessels has turn out to be an established method of antenatal monitoring to predict the at risk fetus. Its indices offer essential data on the hemodynamics of the vascularity of fetal vessels. Umbilical arteries are the usual vessels assessed, however recent research signifies the efficacy of middle cerebral artery (MCA) evaluation for detecting fetal compromise. Studies have shown that MCA blood flow abnormalities were associated with hypoxia and perinatal adverse results. Abnormal MCA/UA ratio displays not only the circulatory insufficiency of the placenta but additionally the adaptive adjustments resulting in adjustments of the

middle cerebral S/D ratio (brain sparing effect). The goal of study is to evaluate the predictive value of cerebroplacental ratio in detection of at risk fetus and preventing adverse perinatal results.

2.MATERIALS AND METHODS

The observational correlational observe performed from October 2015 to October 2017 done in RMMCH, Chidambaram which incorporates one hundred and twenty antenatally recognized severe oligohydramnias patients after getting informed consent.

The Umbilical artery doppler waveforms were obtained from a floating portion of the umbilical cord in the absence of fetal breathing. All the measurements were accomplished in the semi recumbent positions of the patient. For evaluation of fetal MCA Doppler evaluation, an axial view of the fetal biparietal diameter at the level of cerebral peduncles taken, after which the colour Doppler used to visualise the circle of

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Willis, and Doppler wave taken within 1 cm of the origin of the MCA toward the lateral fringe of the orbit which has satisfactory reproducibility (Mari et al., 2005). The attitude among the ultrasonographic beam and direction of blood go with the flow was usually <30 degree. The Doppler signals were recorded with a 3.5 mHz curved array duplex transducer. The UA pulsatility index was considered abnormal when the values were >2 SD, and the MCA pulsatility index were considered peculiar whilst the values were <fifth percentile. MCA/UA S/D <1 become considered ordinary. Doppler ultrasound turned into repeated at 2 weeks c programming language although a few research endorse weekly even as others 2-four weekly evaluation (Turan et al., 2007; Abuhamad, 2008). Data have been gathered with reference to perinatal final results.

3.RESULTS

In our study of 120 patients,

Table 1: Comparison of outcome variables according to status of CPR

Variables	CPR (MCA/UA PI)		P value
	Normal (n=88)	Abnormal (n=32)	
a. Fetal weight <10 th percentile	4(4.5%)	26(81.3%)	0.0001
b. IUGR	31(35.2%)	28(78.1%)	0.0002
c. LSCS for fetal distress	47(53.4%)	10(31.3%)	0.031
d. Preterm delivery	5(5.7%)	14(43.8%)	0.335
e. Apgar score <7	0(0%)	3(9.4%)	0.0036
f. NICU admission	30(34.1%)	19(59.4%)	0.013
g. PN death	0(0%)	4(12.5%)	0.0007

Table and Chart 1 display the assessment of final results variables in cases with normal and abnormal Doppler with CPR. IUGR was seen in 35.2% patients of normal Doppler and 78.1% babies with abnormal Doppler. LSCS for fetal distress observed in 53.4% of normal CPR and 31.3% of patients with abnormal Doppler respectively. Preterm delivery in seen in 43.8% with bizarre Doppler. APGAR score <7 have been seen in three of the sufferers of abnormal CPR. 'NICU admission in 34.1% and 59.4% of sufferers with normal and abnormal Doppler respectively. All four instances of post natal loss of life had abnormal Doppler examine. Strong significance noted among IUGR, Preterm, Apgar score, PN demise with abnormal CPR Doppler. Moderate correlation seen between LSCS for foetal distress, NICU admission with abnormal CPR Doppler.

Regarding Umbilical artery Doppler study significant correlation was seen with preterm delivery and IUGR. No significance observed between other detrimental perinatal outcomes and umbilical artery Doppler study. Moderate correlation seen among NICU admissions and MCA Doppler.

Singh et al (four) found sensitivity, specificity, PPV, NPV of CPR as 63%, 49%, 81%, and 77% respectively.

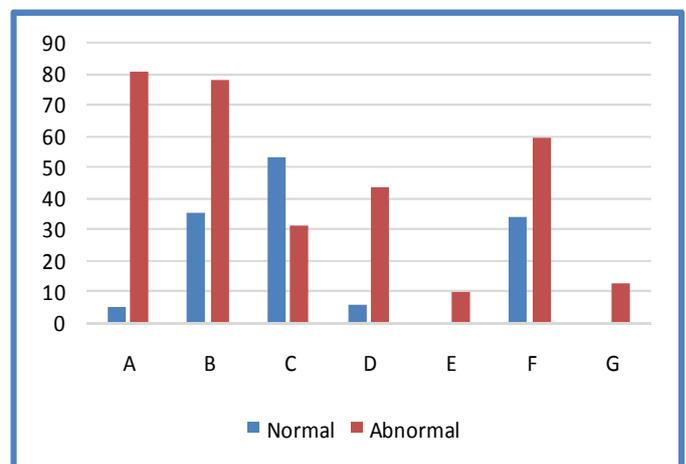
In our study, when comparing different Doppler indices, among the MCA Doppler indices, CPR was found to have the highest sensitivity, specificity, positive predictive value and negative predictive value which were 35%, 100%, 100% and 43.48% respectively. It had the highest accuracy (56.67%).

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4.DISCUSSION:

In our clinical correlational study, an attempt has been made to hit upon role of C/U ratio in assessment of fetal well being and adverse perinatal outcome. Doppler flow velocimetry of the fetal MCA may additionally help in prenatal prognosis and control of complicated pregnancies. Because the MCA/UA ratio carries statistics not most effective on placental status but also on fetal reaction, it's far probably greater effective in predicting fetal outcome. Abnormal MCA/UA Doppler ratio is strongly correlated with worse fetal analysis. Fetal MCA is a high resistance vessel and

corresponds to 7% of fetal cardiac output. Sequential adjustments arise in umbilical artery and MCA for detection of fetal compromise. After then as fetal hypoxia increases, MCA S/D ratio becomes lower than UA S/D ratio. In normal pregnancies, the diastolic component in the cerebral arteries is lower than in the umbilical arteries at any gestational age. Therefore the cerebrovascular resistance remains higher than the placental resistance, and the MCA/UA ratio is greater than 1. The index becomes less than 1 which is called 'centralisation of flow' is abnormal, if the flow distribution is in favour of the brain in pathological pregnancies. A fetus is considered to have brain sparing effect when the ratio is <5th percentile for the gestational age (Cruz-Martinez et al., 2011).

Tarzami et al (2008) also found C/U as a better predictor of perinatal outcome in comparison to its components. In our study, it was concluded that C/U ratio had better value than MCA or UA S/D ratio alone. This is in accordance with Ebrashy et al., (2005). Tarzami et al (2008) additionally discovered C/U as a higher predictor of perinatal outcome in evaluation to its components. In our examine, it turned into concluded that C/U ratio had higher cost than MCA or UA S/D ratio by myself. This is in accordance with Ebrashy et al., (2005).

5.CONCLUSION:

From the above study, this has been concluded that cerebroplacental ratio is having better sensitivity and NPV in detection of IUGR, meconium aspiration syndrome, operative interference for fetal distress, low apgar detection and NICU admission in evaluation of fetal distress. So, better prediction of neonatal outcome can be done through C/U ratio even in the advanced stages of placental insufficiency.

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