



RATIO OF MIDDLE CEREBRAL ARTERY / UMBILICAL ARTERY DOPPLER VELOCIMETRY AND STATUS OF THE NEWBORN IN PREECLAMPSIA



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OBJECTIVE

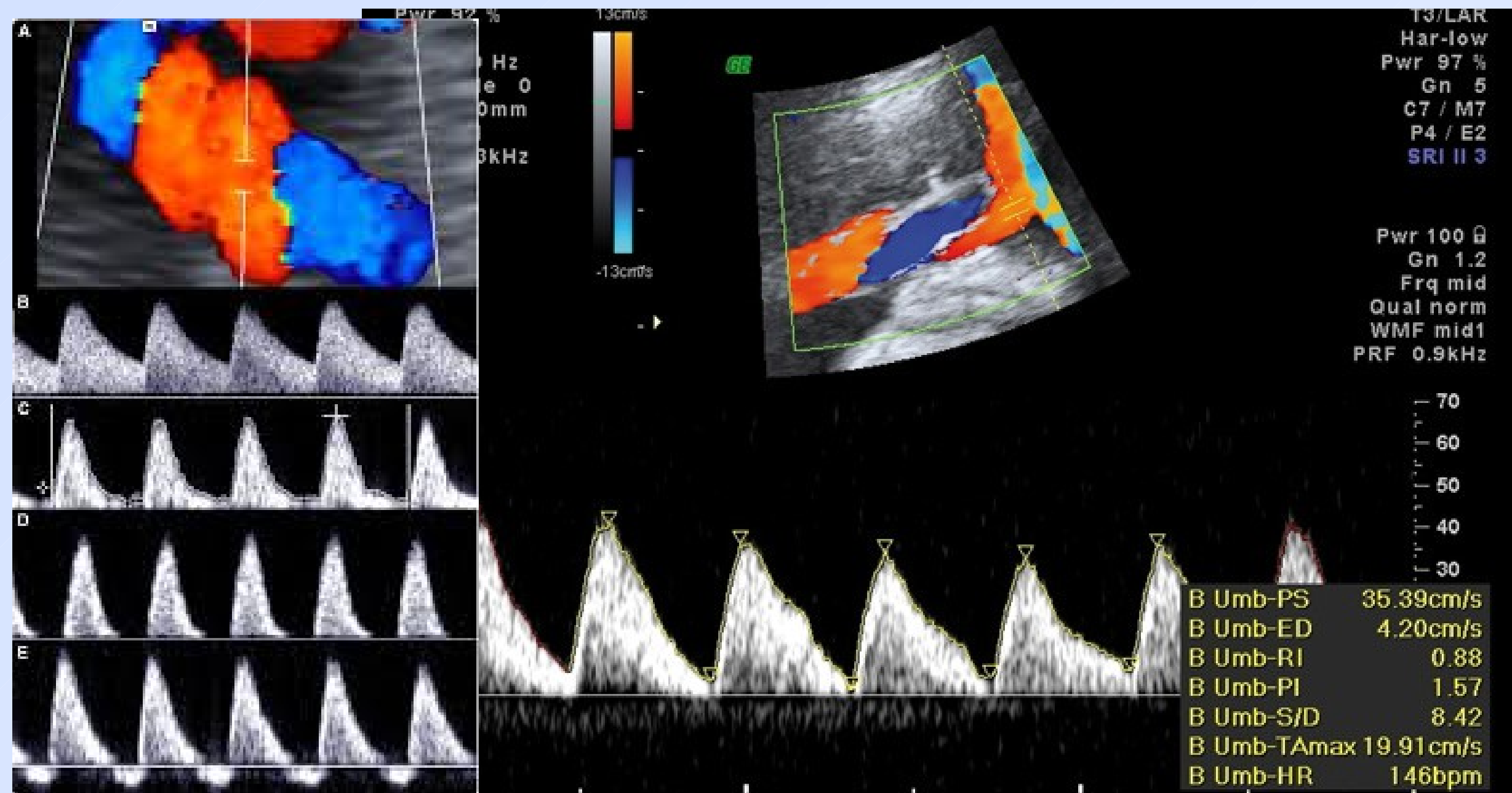
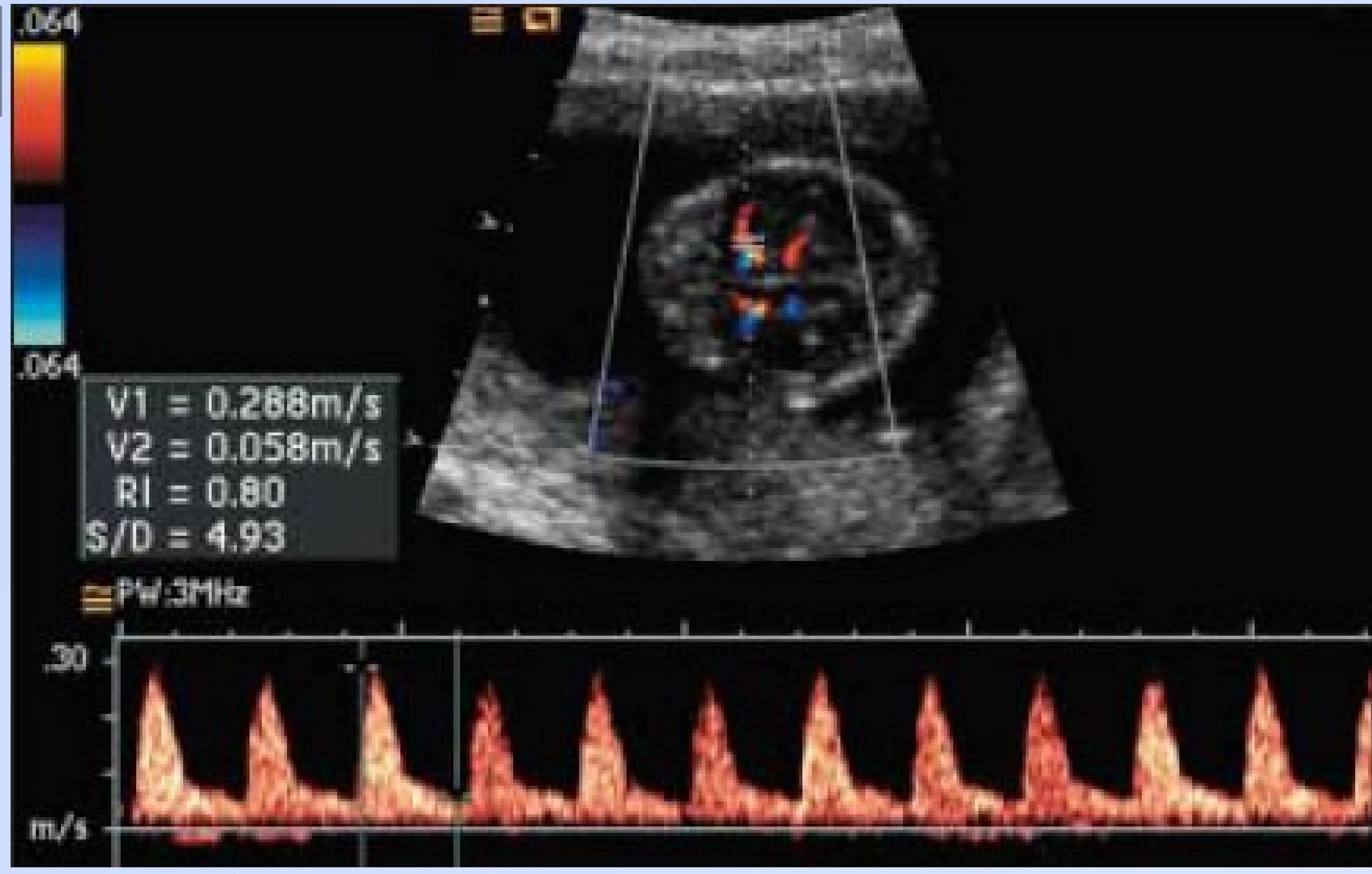
Doppler velocimetry studies of placental/fetal circulation can provide important information regarding fetal well-being, thus expanding the opportunity to improve fetal outcome. This study was undertaken to evaluate role of middle cerebral to umbilical artery blood velocity waveform's systolic/diastolic ratio as a predictor of perinatal outcome in post-term pregnant women.

PATIENTS AND METHODS

This prospective case-control study included 100 pregnant women from our clinic who were divided in 2 groups. 50 pregnant women during 3rd trimester (control group) and 50 pregnant women with preeclampsia (case group). Results of MCA/UA ratio were evaluated with respect to the outcome of infants and adverse perinatal outcome, defined as perinatal death, cesarean delivery for fetal distress, admission to / days in neonatal intensive care unit (NICU) or low Apgar score.

variables	cases n=50	controls n=50	X ²	p
age >25yrs	27 (54%)	24 (48%)	0.3	>0.05
age <25yrs	23 (46%)	26 (52%)		
means±SD	26.2±/-2.1	25.4±/-3.78		
N° of labors >2	8 (16%)	23 (46%)	10	<0.01
N° of labors <2	42 (84%)	27 (54%)		
N° of abortions >2	8 (16%)	14 (28%)	2	>0.05
N° of abortions <2	42 (84%)	36 (72%)		
gestational age(wks)	41±0.14	35.5±1.5	26	<0.01
gestational age (US)	39.8±/-1.6	35±/-1.1	12	>0.01
fetal weight (grams)	3130±624	3241±86	1.3	>0.05
estimated fetal weight EFW (gram)	3216±516	2410±520	0.3	>0.05

table1. Clinical characteristics of patients in studied groups



Doppler parameters index	Cut-off	Sensitivity	Specificity	PPV	NPV
UA-SP	257	56%	45%	14%	50%
UA-RA	0.62	50%	92%	85%	63%
MCA-PI	0.93	40%	60%	48%	50%
MCA-SD	245	48%	60%	52%	57%
MCA-RI	0.67	40%	39%	40%	42%
MCA-PI	0.94	50%	40%	45%	50%
MCA/UA-RI	0.85	80%	72%	62.5%	77%
all parameters	/	85%	85%	90%	95%

table2. Validity of Doppler parameters in prediction of fetal outcome

RESULTS

MCA-RI/UA-RI (resistance index) ratio with cut-off value = 0.85 was found to be the most sensitive parameter in the prediction of adverse perinatal outcome. Among 22 cases admitted to NICU, 15 of them had a ratio below 0.85 (73.7%) and only 7 cases above 0.85 (26.3%). The cerebro-placental ratio screening efficiency for prediction of perinatal outcome (birth weight <10th percentile) was 47% sensitivity, 90% specificity, 95% positive predictive value (PPV), 43% negative predictive value (NPV); whereas for prediction of admission to NICU, it showed 43.5% sensitivity, 90% specificity, 91% positive predictive value and 45% negative predictive value. Compared to the results of the present study, MCA/UA PI (pulsatility index) ratio showed 73.7% sensitivity, 68.3% specificity, 52% PPV and 85% NPV in prediction of perinatal outcome (birth weight <10th percentile) and 71% sensitivity, 72% specificity, 79% PPV and 63% NPV in prediction of admission to NICU.

CONCLUSION

Doppler velocimetry studies of placental and fetal circulation can provide important information regarding fetal well-being, yielding an opportunity to improve fetal outcome. Although the sample-size of our study was small, our results suggested that the MCA/UA Doppler ratio of less than 1.0 was a good predictive tool for neonatal outcome in post-term pregnant women and could be used to identify fetuses at risk of morbidity.

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