Cerebroplacental ratio and neonatal outcome in low-risk pregnancies with reduced fetal movement: a prospective study

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OBJECTIVE

To evaluate the effectiveness of the cerebroplacental ratio (CPR) in predicting poor outcomes in low-risk pregnancies with reduced fetal movements (RFMs).

METHODS

This prospective study included singleton pregnancies at 28–40 weeks, presenting with RFM but no additional risk factors. Sub analysis was performed for pregnancies between 36-40 weeks. Umbilical artery (UA) and middle cerebral artery (MCA) pulsatility indices (PIs) were measured, and the MCA-PI to UA-PI ratio (CPR) was calculated. Mode of delivery, gestational age, fetal monitoring category, Apgar score at 1 and 5 min, birth weight, presence of meconium, umbilical artery pH, and neonatal intensive care unit (NICU) admission were recorded. Women with good and poor outcomes were compared with doppler indices and pregnancy characteristics.

RESULTS

Of 96 women, 86 had good outcomes. There was no significant difference in UA-PI (0.871±0.171 vs. 0.815±0.179, P=0.446), MCA-PI (1.778±0.343 vs. 1.685±0.373, P=0.309), or CPR (2.107±0.635 vs. 2.09±0.597, P=0.993) between the poor and good outcome groups. No difference was found in the location of the placenta, biophysical profile (BPP) score, fetal sex, or amniotic fluid index (AFI) at the time of presentation. The proportion of nulliparous patients in the poor outcome group was higher than that of multiparous patients. Sub analysis for 36-40 weeks revealed the same results; no significant difference in UA-PI (0.840± 0.184 Vs 0.815± 0.195, P=0.599), MCA-PI (1.724±0.403 vs. 1.626 ±0.382, P=0.523), or CPR (2.14±0.762 vs. 2.08±0.655, P=0.931) between poor and good outcome groups.

Table 1:

Results of Doppler studies in both groups Gestational week 28-40

	Good outcome	Poor outcome	P-value 2-sided Mann-Whitney Test
UA-PI Mean (Standard deviation)	0.815± (0.179)	0.871± (0.171)	.4460
MCA-PI Mean (Standard deviation)	1.685± (0.373)	1.778± (0.343)	0.309
CPR Mean (Standard deviation)	2.09± (0.597)	2.107± (0.635)	0.993

UA, Umbilical artery; PI, pulsatility index; MCA, middle cerebral artery; CPR, cerebroplacental ratio (MCA-PI to UA-PI ratio)

Table 2:

Results of Doppler studies in both groups of 36-40 weeks gestational age

	Good outcome	Poor outcome	P 2-sided Wilcoxon Rank
UA-PI Mean (std. Deviation)	0.815± (0.195)	0.840± (0.184)	.5990
MCA- PI Mean (std. Deviation)	1.626± (0.382)	1.724± (0.403)	0.523
CPR Mean (std. Deviation)	2.08±(0.655)	2.14± (0.762)	0.931

UA, Umbilical artery; PI, pulsatility index; MCA, middle cerebral artery; CPR, cerebroplacental ratio (MCA-PI to UA-PI ratio)

CONCLUSIONS

CPR is not predictive of neonatal outcome in low-risk pregnancies with RFM. However, a higher proportion of poor outcomes in nulliparous women warrants further investigation.