

Prediction of adverse outcomes in preeclampsia using placental, fetal and cardiac markers

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Objective:

To assess the performance of placental, cardiac and fetal markers in the prediction of adverse outcomes in women with suspected or confirmed preeclampsia.

Methods:

This is a prospective study of women with suspected or confirmed preeclampsia. At the time of recruitment, participating women underwent a series of investigations to measure hemodynamic indices, mean arterial pressure (MAP), augmentation index (Aix), ophthalmic artery peak ratio (OA-PR), uterine artery pulsatility index (UTA-PI), fetal growth and wellbeing, soluble fms-like tyrosine kinase-1 (sFLT-1), and placental growth factor (PLGF). The performance of these markers in predicting adverse maternal outcomes and adverse perinatal outcomes were then assessed.

Adverse maternal outcomes	Adverse perinatal outcomes
Parenteral anti-hypertensives	Preterm birth for PE < 34 weeks' gestation
ICU admission	NICU admission
Eclampsia	Respiratory distress syndrome
Placental abruption	Intraventricular hemorrhage
HELLP syndrome	Hypoxic ischemic encephalopathy
DIC	Necrotizing enterocolitis
Platelets < 100x10 ⁹ /L	Retinopathy of prematurity
Creatinine > 90umol/L	
Alanine aminotransferase > 100U/L	

Table 1: Definitions of adverse outcomes

Results:

This study included 126 women with suspected or confirmed preeclampsia with a median gestational age of recruitment of 33.9 weeks. The rate of adverse maternal outcomes was 39% and the rate of adverse perinatal outcomes was 38%.

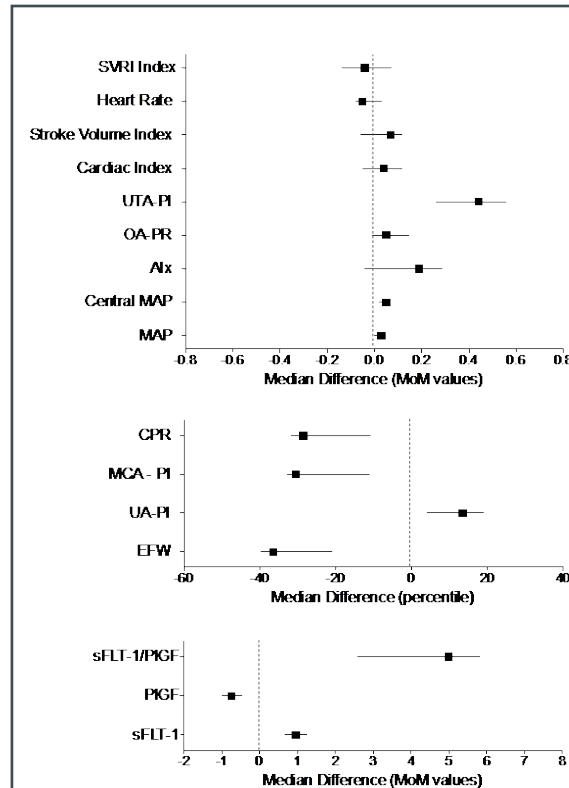


Figure 1: Differences in potential prognostic indices by adverse perinatal outcomes

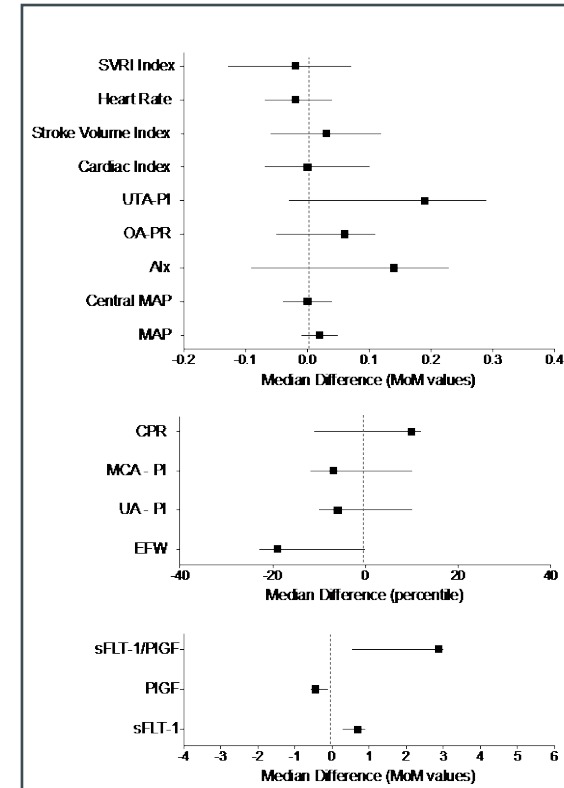


Figure 2: Differences in potential prognostic indices by adverse maternal outcomes

	AUROC (95% CI)	Sensitivity for 10% FPR
sFLT-1/PIGF	0.87 (0.81-0.93)	54 (25-75)
EFW (percentile)	0.81 (0.73-0.89)	56 (38-74)
CPR	0.71 (0.61-0.80)	33 (16-56)
UTA-PI	0.76 (0.67-0.85)	40 (25-58)
OA-PR	0.60 (0.49-0.70)	27 (13-43)
Best combined model	0.88 (0.82-0.94)	63 (33-81)

Table 2: Performance of indices in predicting adverse maternal and perinatal outcomes

	AUROC (95% CI)	Sensitivity for 10% FPR
sFLT-1/PIGF	0.69 (0.59-0.78)	14 (2-41)
EFW (percentile)	0.61 (0.50-0.71)	12 (5-31)
Best combined model	0.71 (0.61-0.80)	22 (8-43)

Table 3: Performance of indices in predicting adverse maternal and perinatal outcomes

Conclusion:

sFLT-1/PIGF performs well in predicting adverse perinatal outcomes and poorly in predicting adverse maternal outcomes in women with suspected or diagnosed preeclampsia. The addition of cardiac, fetal and vascular indices to these markers is unlikely to improve prognostic performance of the sFLT-1/PIGF ratio.