

EP16.146: Prediction of preeclampsia using mean arterial pressure and mean platelet volume among antenatal women at moderate risk in Abuja: A cohort study



Suraiya S. Auwal¹, Surajudeen Bello¹, Ochuwa Babah⁴, Ibraheem Muhammad-Ra'is¹, Christiana Udo², Asma'u Ribadu³, Aisha Gwary³

1. Obstetrics & Gynaecology, National Hospital Abuja, Abuja, Federal Capital Territory, Nigeria.
2. Haematology and blood transfusion services, National Hospital Abuja, Abuja, FCT, Nigeria.
3. Obstetrics & Gynaecology, Federal Medical Centre Abuja, Abuja, FCT, Nigeria.
4. Obstetrics & Gynaecology, Lagos University Teaching Hospital, Surulere, Lagos, Nigeria.

Introduction:

Preeclampsia a known cause of perinatal and maternal morbidity and mortality, affects 2-5% of pregnant women globally. The recommended first trimester screening using a combination of maternal risk factors, mean arterial pressure (MAP), uterine artery pulsatility index and biomarkers for early prediction is either unfeasible, unaffordable or inaccessible in most low-middle income countries. Mean platelet volume (MPV) is available and a relatively cheap test that may prove useful in preeclampsia prediction in low resource settings.

Objective:

This study aimed to determine the predictive accuracy of preeclampsia screening between 11- and 19+6-weeks' gestation using MAP and MPV among antenatal women at moderate risk of PE in Abuja, Nigeria.

Methods:

This was a cohort study conducted at the antenatal clinics of two tertiary hospitals in Abuja between February 2024 and October 2024. A total of 328 consenting pregnant women with a single moderate risk factor for preeclampsia between 11- and 19+6-weeks' gestation were recruited using consecutive sampling technique. MAP and MPV were assessed at recruitment, and the participants were followed up till occurrence of PE or 37 weeks, whichever came first. Data analysis was done using IBM SPSS v26.

Results:

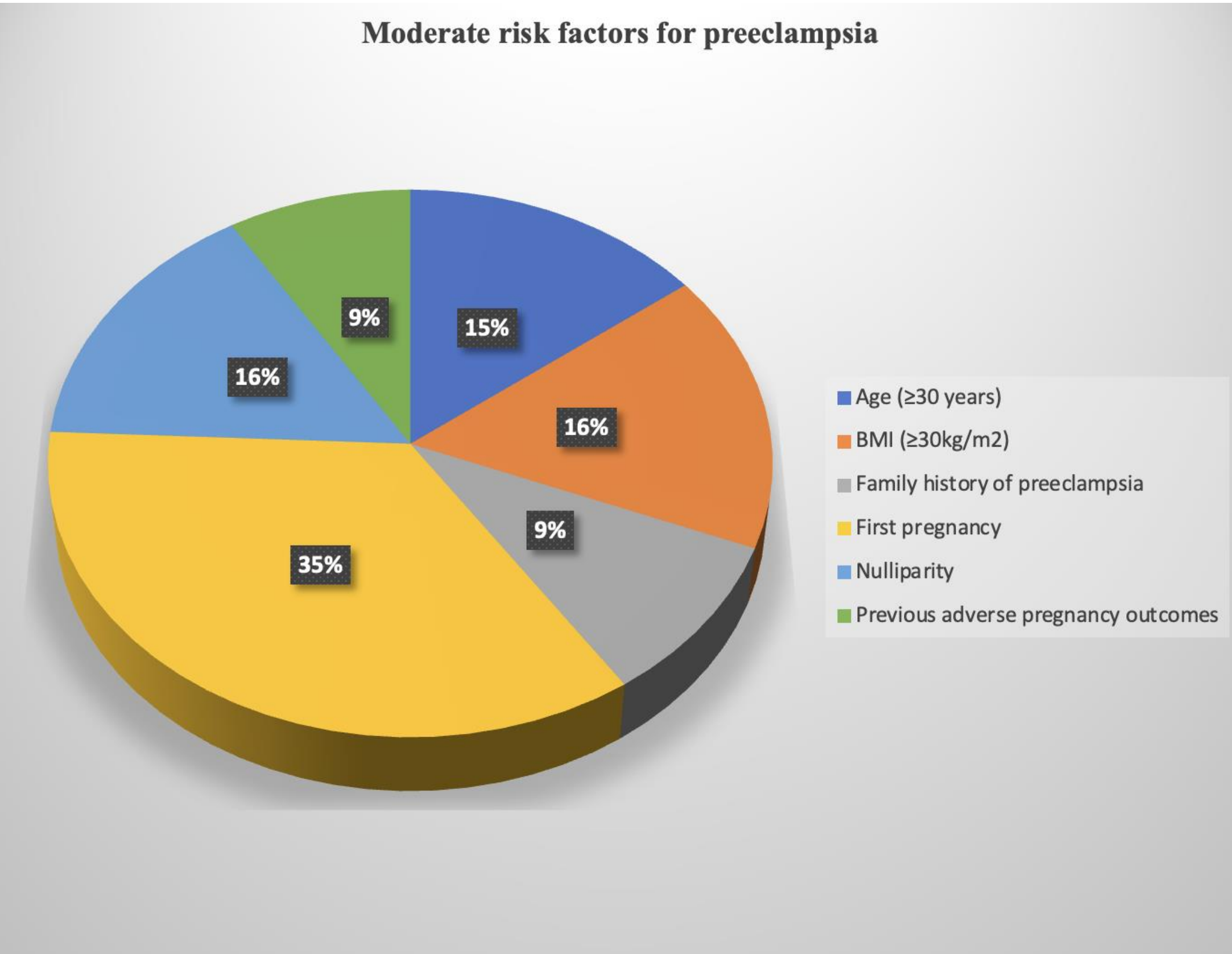


Figure 1. Maternal risk factors for development of preeclampsia among study participants, n=328

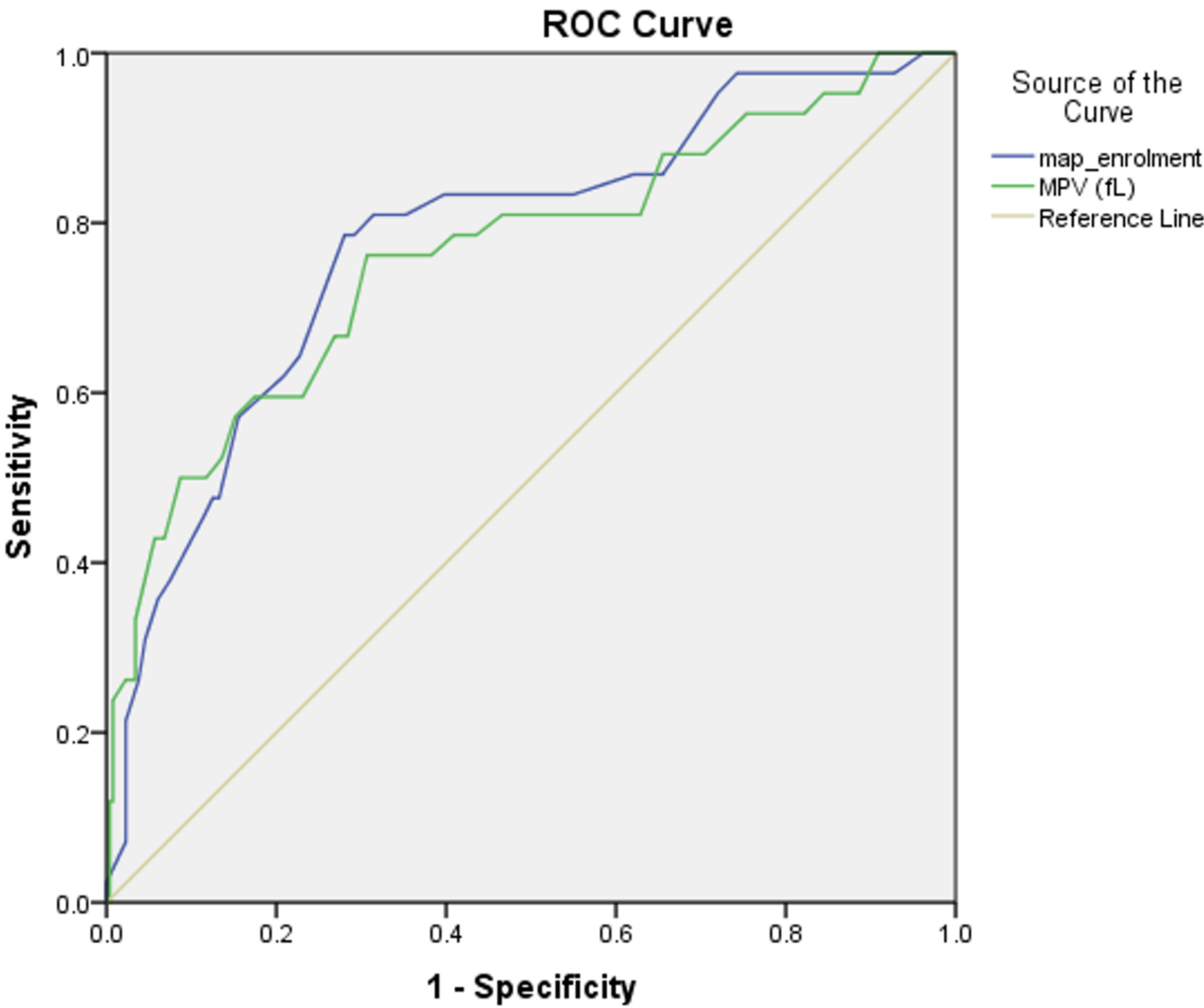


Figure 2. Diagnostic accuracy of mean arterial blood pressure and mean platelet volume measured before 20 weeks of gestation for preeclampsia prediction.

Conclusion

MAP cut-off of 89.5mmHg and MPV cut-off of 9.95fL were associated with the development of preeclampsia among study participants. Combined MAP and MPV, especially by parallel testing, may be an effective screening tool for preeclampsia in low resource settings, where biomarkers and/or uterine artery doppler may not be feasible.

Table 1 Predictive accuracy of mean arterial pressure and mean platelet volume measured at 11-19 weeks' gestation for predicting preeclampsia and its severity.

Detection rate (95% CI)							
Screening tests	AUC (95% CI)	Sensitivity	Specificity	PPV	NPV	Cutoff	<i>p</i> -value
		(%)	(%)	(%)	(%)	value	
Preeclampsia prediction, n = 306							
MAP (mmHg)	0.78 (0.70-0.86)	78.6	72.0	30.8	95.5	89.5	<0.001
MPV (fL)	0.76 (0.68-0.85)	76.2	69.3	28.3	94.8	9.95	<0.001
Preeclampsia severity prediction, n = 42							
MAP (mmHg)	0.68 (0.50-0.86)	46.2	89.7	66.7	78.8	101.5	0.066
MPV (fL)	0.73 (0.56-0.90)	61.5	89.7	72.7	83.9	11.4	0.017

AUC = area under ROC curve, ROC = Receiver Operating Characteristic, MAP = mean arterial blood pressure, PPV = positive predictive value, NPV = negative predictive value.

Table 2 The combined sensitivities and specificities of using mean arterial pressure and mean platelet volume at 11-19 weeks' gestation to predict preeclampsia and its severity, n = 306.

Preeclampsia prediction	MAP (mmHg)	MPV (fL)	Serial testing	Parallel testing
Sensitivity (%)	78.6	76.2	59.9	94.9
Specificity (%)	72.0	69.3	91.4	49.9
Preeclampsia severity prediction	MAP (mmHg)	MPV (fL)	Serial testing	Parallel testing
Sensitivity (%)	46.2	61.5	28.4	79.3
Specificity (%)	89.7	89.7	98.9	80.5

fL, femtolitre; MAP, mean arterial blood pressure; MPV, mean platelet volume; mmHg, millimeter of mercury.

Table 3: Binary Logistic Regression Predicting Preeclampsia among study participants

Predictive tests	B	SE	Wald	OR (Exp [B])	95% CI for OR	<i>p</i> -value
MAP (mmHg)	0.13	0.03	27.32	1.14	[1.08, 1.20]	0.001
MPV (fL)	0.75	0.18	17.99	2.12	[1.50, 2.99]	0.001

B = Regression Coefficient β , CI = Confidence Interval, Exp (B) = Exponentiated Coefficient β , OR = Odds Ratio, SE = Standard Error, Wald = Wald Chi-Square Statistic.