

B-type natriuretic peptide vs angiogenic biomarkers for predicting short-term adverse outcomes in hypertensive disorders of pregnancy

A prospective cohort study

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OBJECTIVE

B-type natriuretic peptide (BNP), a biomarker of myocardial wall stress, may reflect cardiovascular maladaptation in hypertensive disorders of pregnancy and represents a potentially accessible biomarker in resource-constrained settings.

We aimed to compare the predictive performance of BNP with the sFlt-1/PIGF ratio for short-term adverse maternal and perinatal outcomes in women with hypertensive disorders of pregnancy in Colombia, and to explore BNP as a potential lower-cost alternative in a middle-income setting.

METHODS

- Prospective cohort of 123 pregnant women between 20 and 36 weeks of gestation admitted with hypertensive disorders of pregnancy in Cartagena, Colombia.
- BNP and the sFlt-1/PIGF ratio were measured at admission, with results blinded to the clinical team.
- Primary outcomes were adverse maternal outcomes within 48 hours and adverse perinatal outcomes.
- Predictive performance was assessed using discrimination, sensitivity, specificity, predictive values, and likelihood ratios.

RESULTS

- For adverse maternal outcomes within 48 hours, BNP showed discrimination comparable to the sFlt-1/PIGF ratio (AUC 0.75 vs 0.72), with higher sensitivity (0.95 vs 0.80) and negative predictive value (0.98 vs 0.94).
- For adverse perinatal outcomes, the sFlt-1/PIGF ratio demonstrated better discrimination than BNP (AUC 0.79 vs 0.73) and higher specificity (0.92 vs 0.81).
- Combining BNP with the sFlt-1/PIGF ratio modestly improved discrimination for both maternal (AUC 0.77) and perinatal outcomes (AUC 0.81).

ROC CURVES COMBINED MODELS

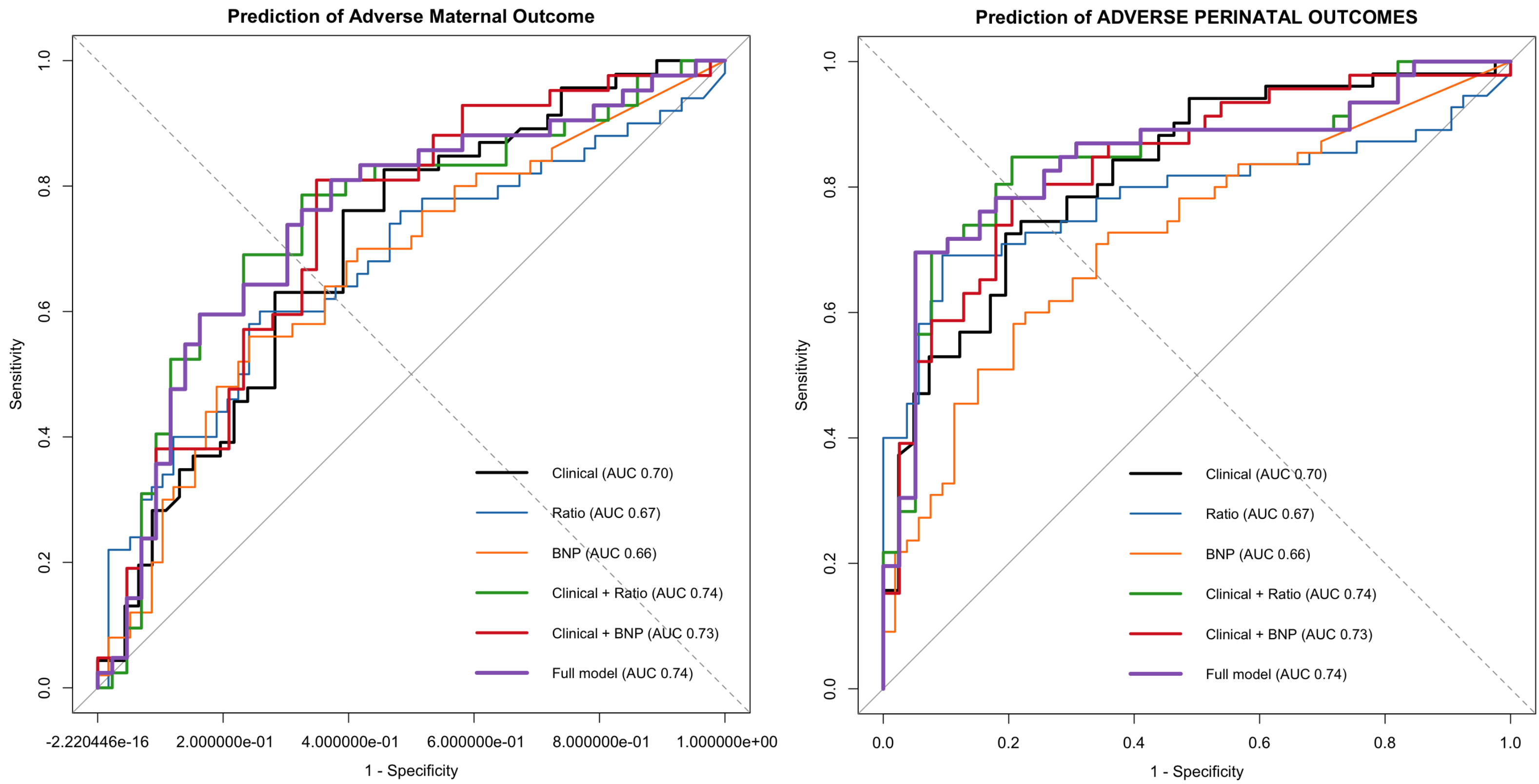


Figure 1. ROC curves of the combined model (BNP + sFlt-1/PIGF ratio) for adverse maternal and adverse perinatal outcomes.

PREDICTIVE PERFORMANCE

	AUC	Sens	Spec	NPV
Adverse maternal outcome ≤ 48 h				
BNP	0.75	0.95	0.45	0.98
sFlt-1/PIGF	0.72	0.80	0.61	0.94
Combined	0.77	0.82	0.68	0.95

Marker	AUC	Spec
Adverse perinatal outcome		
BNP	0.73	0.81
sFlt-1/PIGF	0.79	0.92
Combined	0.81	0.91

Sens = sensitivity; Spec = specificity; NPV = negative predictive value.



KEY FINDINGS

0.75 AUC

BNP for adverse maternal outcome ≤ 48 h (ratio 0.72)

0.98 NPV

BNP rule-out of adverse maternal outcome (ratio 0.94)

0.81 AUC

Combined model for adverse perinatal outcome

CONCLUSIONS

- BNP demonstrated comparable discrimination to the sFlt-1/PIGF ratio for predicting short-term adverse maternal outcomes, with a particularly high negative predictive value.
- In middle-income settings such as Colombia, BNP may represent a potentially accessible biomarker to support short-term maternal risk stratification when angiogenic biomarkers are unavailable or difficult to implement.
- The sFlt-1/PIGF ratio retained better performance for adverse perinatal outcomes, while combining both biomarkers provided the highest overall discrimination.

KEYWORDS

Pre-eclampsia · Serum biochemistry · Statistical techniques