

The performance of ASPRE based screening in routine clinical practice.



Teddy Golob and Ramesh Ganapathy – Epsom and St Helier NHS trust, London UK.

Objective:

UK national guidelines from the National Institute of Clinical Care Excellence (NICE) recommend screening for preeclampsia (PE) based on maternal characteristics [1]. There is evidence that such screening has a poor detection rate [2]. The Fetal Medicine Foundation (FMF) has proposed a model for screening at 11-13 weeks that includes maternal blood pressure, uterine artery Doppler and placental growth factor (PLGF) [3]. The objective of our study was to compare the effectiveness of combined screening for PE using the FMF algorithm compared to a maternal-factor based model (NICE).

Design:

This was a retrospective cohort study from January 2022 to April 2024. The inclusion criteria was women who consented to screening for PE at 11-13 weeks' gestation with a viable singleton pregnancy. We excluded multiple pregnancies, fetal abnormalities, miscarriages, terminations and those with incomplete outcome data. PE was defined by ISSHP [4] definition and was divided into early (<34 weeks), preterm (<37 weeks) and term (≥37 weeks'). Detection rates (DR) and screen positive rates (SPR) were compared between the FMF and NICE models. The study was approved by NHS Health research authority (no. 326047).

Preeclampsia	NICE	FMF	P value
Detection rate for early PE <34 weeks'	2/12 (16.6%)	10/12 (83.3%)	0.004
Detection rate for preterm PE < 37 weeks'	13/46 (28.2%)	36/46 (78.3%)	<0.001
Detection rate for late PE ≥ 37 weeks'	17/49 (34.6%)	22/49 (44.9%)	0.409
Screen positive rate	857/7342 (11.7%)	569/7342 (7.8%)	<0.001

Table 1. Detection rate and screen positive rate of screening for PE based on screening criteria from NICE and FMF.

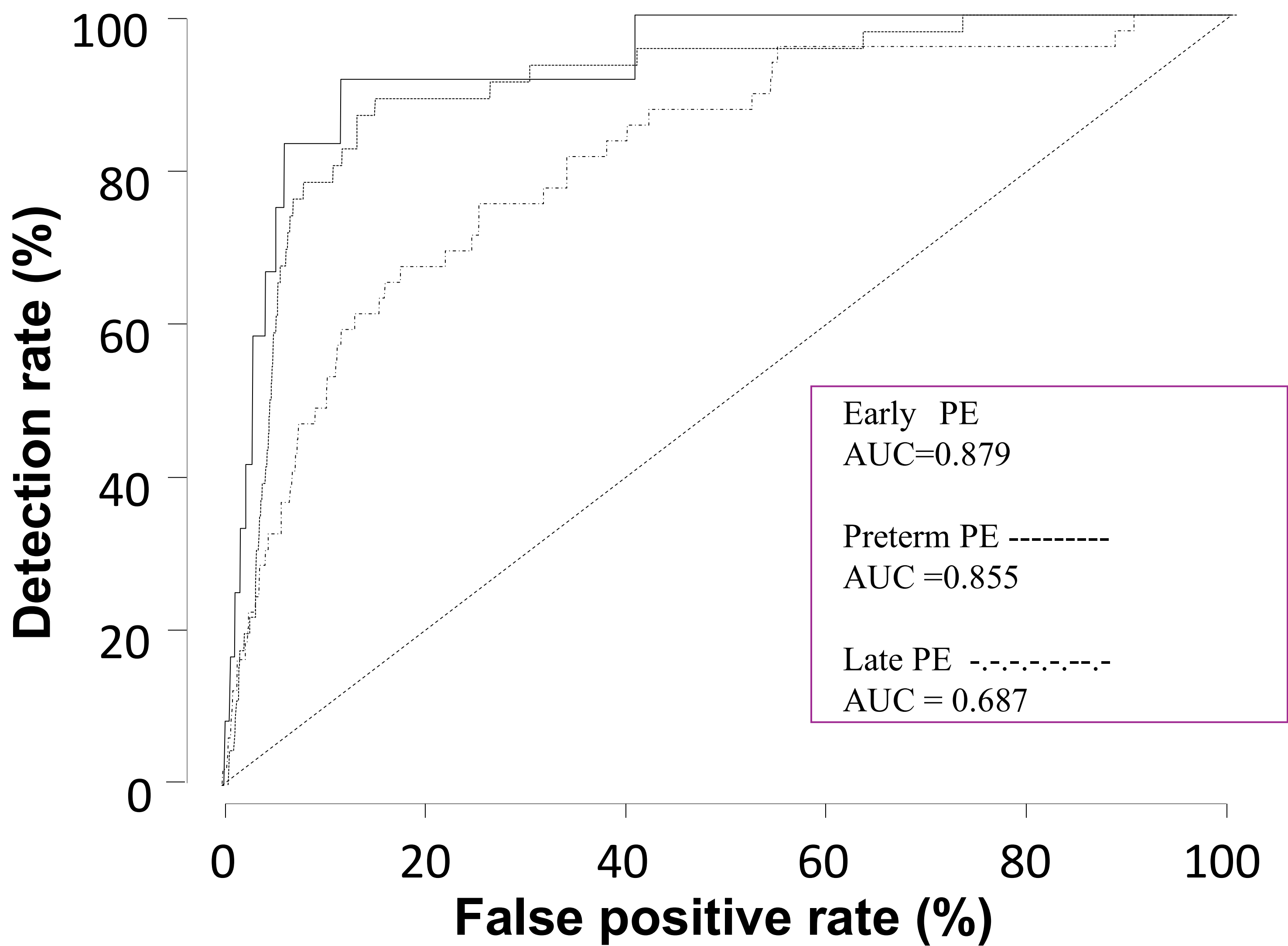


Figure 1. ROC curve of detection of preeclampsia by FMF algorithm

Results:

The study population included 7,342 singleton pregnancies. The total incidence of PE in our study was 1.3% (n=95/7,342). Corresponding rates of early, preterm and term PE were 0.16% (n=12/7,342), 0.63% (n=46/7,342) and 0.67% (49/7,342), respectively. The DR of early, preterm and term PE based on FMF algorithm were 83.3% (n=10/12), 78.3% (n=36/46) and 44.9% (n=22/49) for a SPR of 7.6% whereas the corresponding rates of screening by NICE were 16.6% (n=2/12), 28.2% (n=13/46) and 34.6% (n=17/49) respectively for a SPR of 11.7%. The difference in detection was significant for early PE (p=0.004) and preterm PE (p=<0.001) but not for term PE (p=0.409). The difference in SPR was statistically significant (P = <0.001).

Conclusion:

The FMF algorithm was more accurate at predicting early PE and preterm PE but was not significantly different in its prediction of term PE.

References:

1. Hypertension in pregnancy: diagnosis and management. 2023. NICE
2. Tan et al. Protocol for the prospective validation study: 'Screening programme for pre-eclampsia' (SPREE). 2017.
3. Akolekar R et al. Competing Risks Model in Early Screening for Preeclampsia by Biophysical and Biochemical Markers. 2013.
4. Brown M et al. The hypertensive disorders of pregnancy: ISSHP classification, diagnosis & management recommendations for international practice. 2018.