

First-Trimester Prediction and Prevention of Preterm Pre-Eclampsia in Women with Chronic Hypertension

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■ BACKGROUND

Chronic hypertension (CH) is a major risk factor for preterm pre-eclampsia (PE), and most guidelines recommend aspirin for all affected women. However, the performance of first-trimester PE screening in this subgroup, the proportion of women who obtain a low-risk result, and whether aspirin might safely be withheld in those women, remain undefined.

■ OBJECTIVES

- Quantify the effect of aspirin on gestational age at delivery with PE in women with CH.
- Evaluate the FMF competing-risks screening model for preterm PE in this subgroup.
- Determine the proportion classified as low risk and the influence of parity, previous PE and biomarkers.

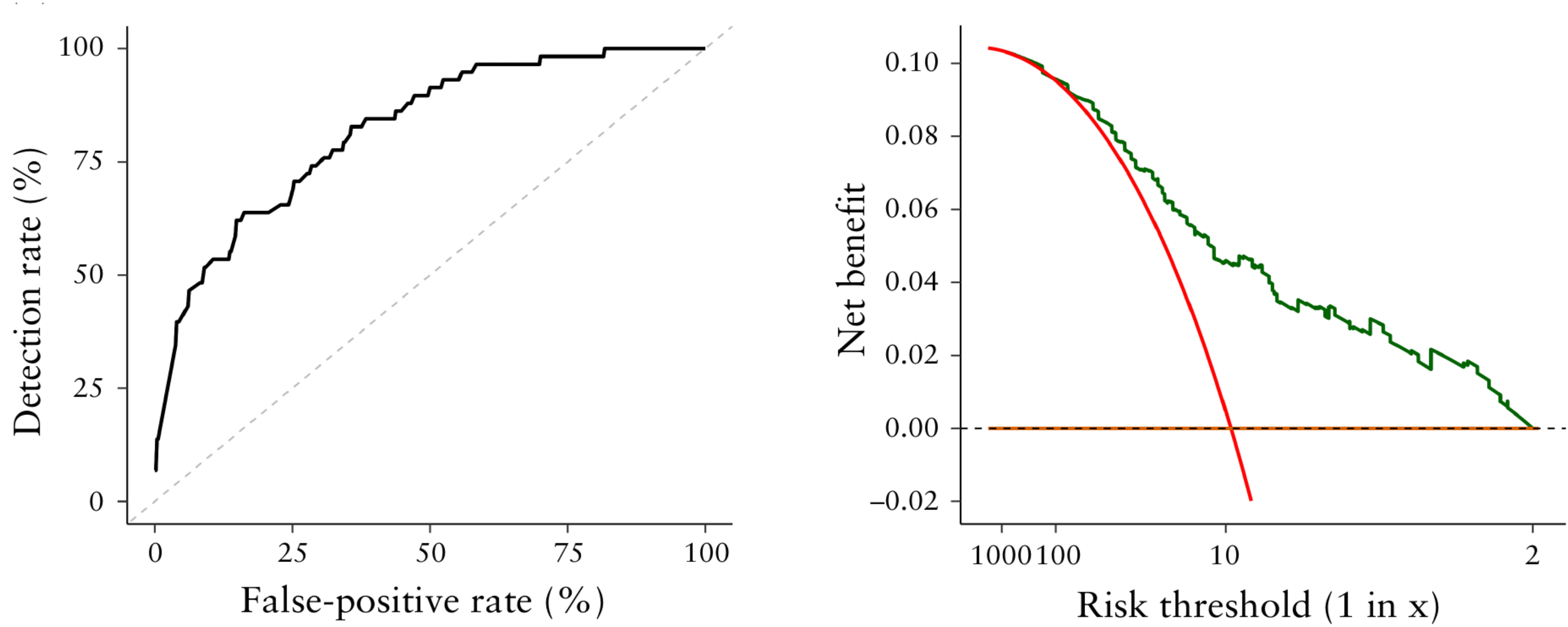
■ METHODS

- Combined analysis of two multicentre first-trimester PE screening studies, the ASPRE trial and the SPREE study, restricted to women with CH,
- Aspirin effect on gestational age at delivery estimated by Bayesian inference.
- Screening performance assessed by discrimination, calibration and decision-curve analysis.
- Monte Carlo simulation of 100,000 women with CH for biomarker effects.

■ RESULTS

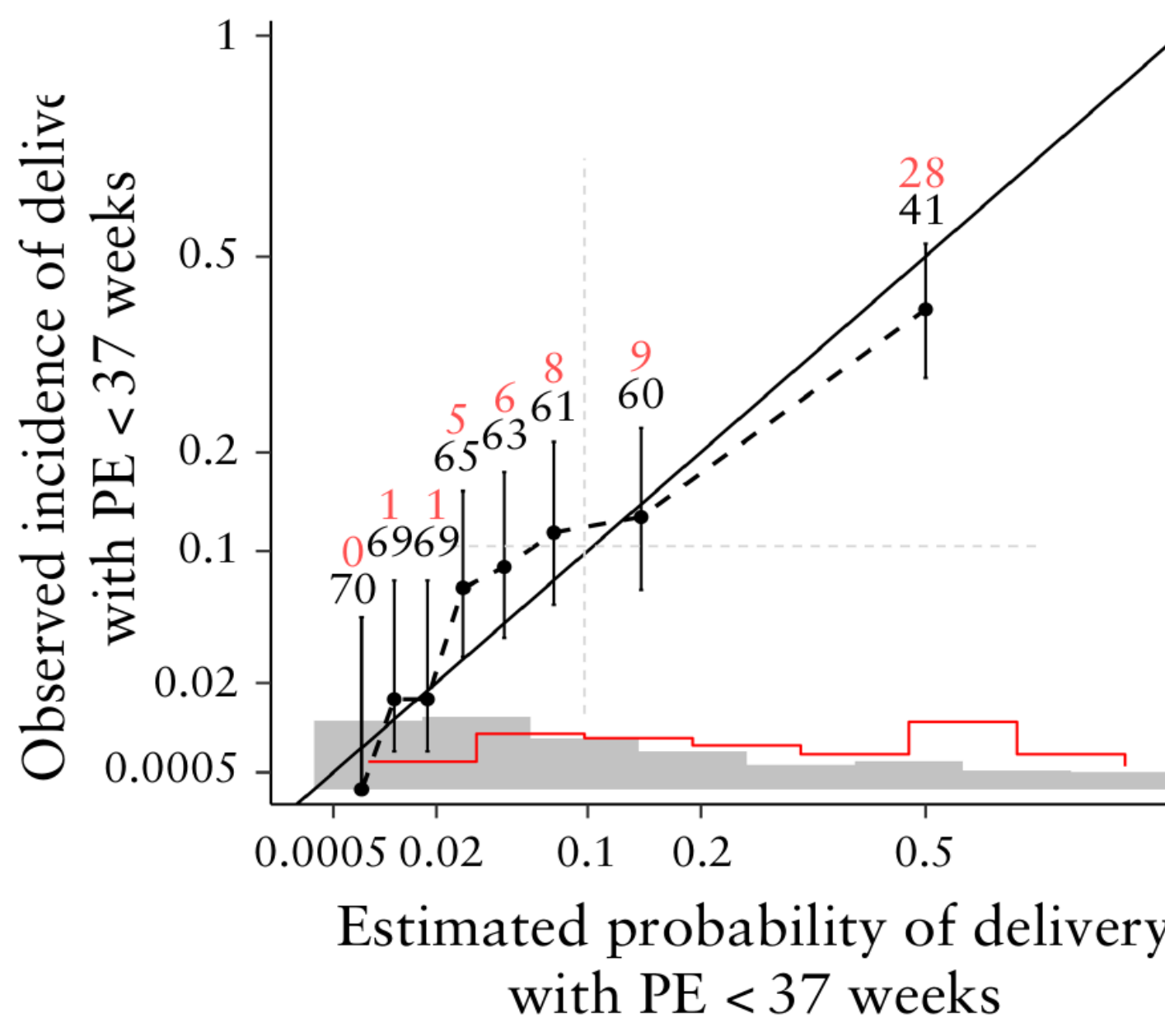
Study population: 51,024 screened pregnancies, of whom 556 (1.1%) had chronic hypertension; of these, 139 (25.0%) developed PE and 58 (10.4%) preterm PE.

Figure 1. Screening performance of the FMF model



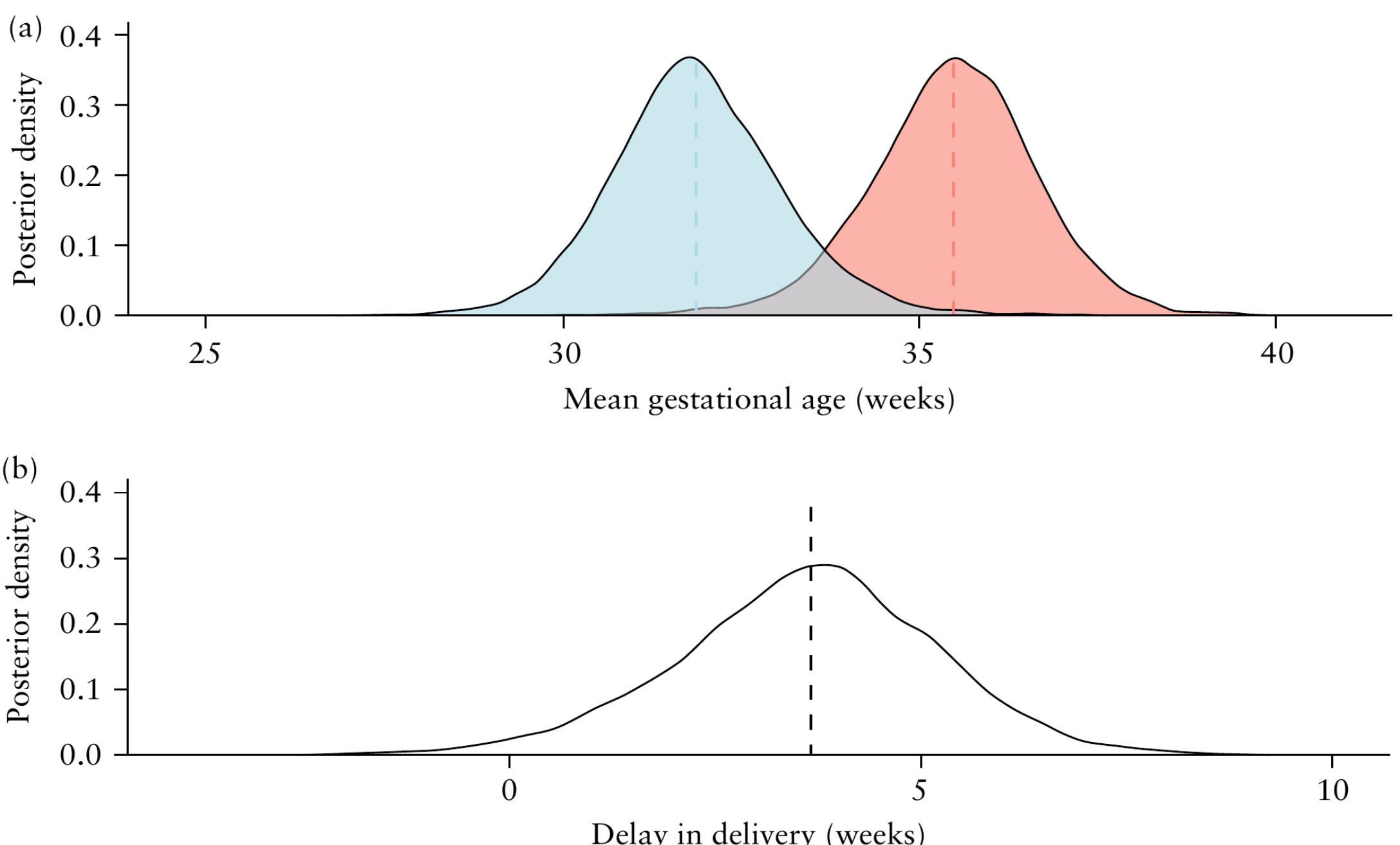
ROC curve (left) and decision-curve analysis (right); FMF model in green, treat-all in red, treat-none in orange.

Figure 2. Calibration



Predicted versus observed incidence of preterm PE across deciles of risk; red numbers denote cases. Points follow the diagonal, indicating good calibration.

Figure 3. Effect of aspirin on delivery



(a) Posterior mean gestational age at delivery with preterm PE, aspirin (red) versus placebo (blue). (b) Delay attributable to aspirin. Dashed lines are medians.

3.6 weeks

mean delay in delivery with preterm PE on aspirin (95% CrI 0.2 to 6.6); 98% posterior probability of benefit

AUC 0.819

for preterm PE (95% CI 0.763 to 0.874); adequate calibration and higher net benefit than treating all

21.8%

of women with CH screened low risk (< 1 in 100); only 1 of 121 developed preterm PE

- Aspirin delayed delivery with preterm PE by a mean of 3.6 weeks (94% probability of a delay of at least one week).
- Decision-curve analysis showed the FMF model gave higher net benefit than treating all or treating none across the clinically relevant threshold range.
- Women who developed preterm PE had higher MAP and UtA-PI and lower PIGF (all P < 0.001); predicted risk was driven mainly by MAP and PIGF, with one in five women screening low risk.

■ CONCLUSIONS

- Aspirin delays delivery with preterm PE by 3.6 weeks in women with CH.
- The FMF model gives higher net benefit than treating all; risk is driven mainly by MAP and PIGF, with one in five women low risk.

■ REFERENCES

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