



Preeclampsia prediction before 11.0 weeks of gestation: ASPIRIN trial secondary analysis

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Objective

- To develop a prediction model for preeclampsia/eclampsia before 11.0 weeks of gestation as a proof of concept in a secondary analysis of the ASPIRIN trial

Study design

- Secondary analysis of the ASPIRIN trial, a multinational, randomized, double-blind, placebo-controlled trial



11,976 nulliparous pregnant women aged 18–40 with gestational ages of 6.0–13.6 weeks at randomization.



Aspirin (81 mg/day) until 36.0 weeks or delivery



Placebo until 36.0 weeks or delivery

- Inclusion criteria:** pregnancies delivered at ≥ 20.0 weeks
- Excluding criteria:** Patients in the aspirin group or with gestational ages ≥ 11.0 weeks at randomization
- The composite **outcome** was preeclampsia/eclampsia
- Available predictor variables:** Maternal age, education (4 categories), body mass index (BMI), gravidity, baseline hemoglobin, baseline systolic blood pressure, and baseline diastolic blood pressure

Statistical analysis: Logistic regression, with logarithmic transformation for continuous variables, was used to develop the model. The area under the ROC curve with a 95% confidence interval (CI) estimated via bootstrap resampling (1,000 iterations) and the *P*-value of the Hosmer-Lemeshow statistical test are reported as discrimination and calibration measures. This study used the entire available sample using a complete case approach.

Results

- 3,421 participants met the inclusion criteria, with a cumulative incidence of preeclampsia/eclampsia of 2.9% (99/3,421)**
- Maternal age was significantly higher in the preeclampsia/eclampsia group (21.96 ± 4.13 vs. 20.86 ± 3.21 , $P < 0.001$)
- BMI was also higher in the preeclampsia/eclampsia group (22.49 ± 4.77 vs. 20.79 ± 3.55 , $P < 0.001$)
- Gravidity was lower ($P = 0.023$)
- Hemoglobin levels were slightly elevated (11.88 ± 1.52 g/dL vs. 11.50 ± 1.61 g/dL, $P = 0.019$) in the preeclampsia/eclampsia group
- Educational level ($P = 0.070$), systolic blood pressure ($P = 0.720$), and diastolic blood pressure ($P = 0.390$) showed no significant differences between groups

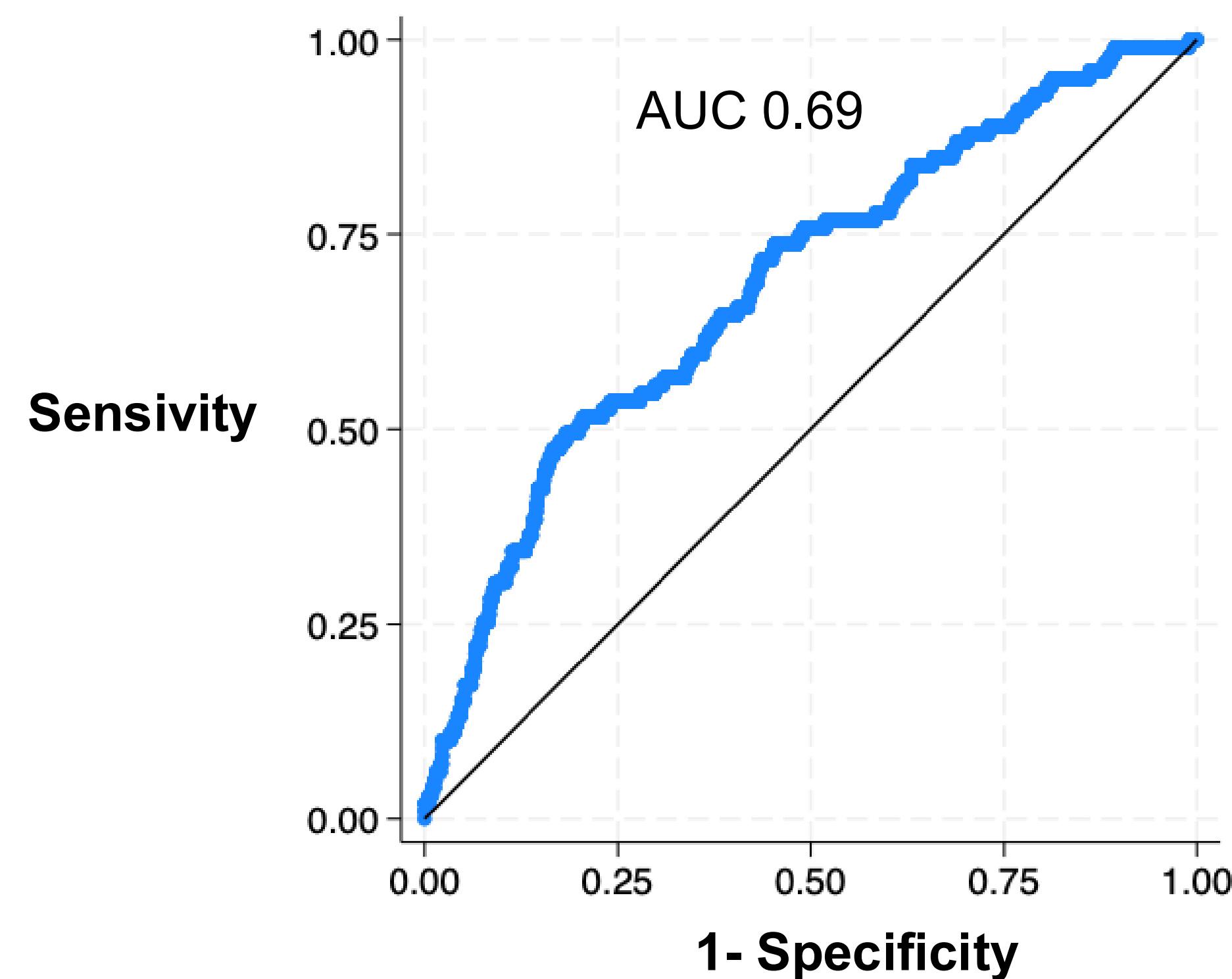


Figure 1. The logistic regression model yielded an AUC of 0.69 (95% CI: 0.63–0.74), and the Hosmer-Lemeshow test *P*-value was 0.094, indicating acceptable discrimination and calibration

Conclusion

- This proof-of-concept model using first-trimester maternal characteristics demonstrated acceptable predictive performance for preeclampsia/eclampsia before 11.0 weeks of gestation**
- During this critical period, several interventions could be proposed to reduce preeclampsia risk, including medication adjustments, lifestyle changes, and appropriate referral if needed
- Further studies are required to validate these findings and assess their clinical utility in different settings

References

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