Competing risks model for prediction of preeclampsia

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TO THE EDITORS: We are grateful to Drs Guerby and Bujold for raising an important question.[1] The competing risks model uses data on maternal demographic characteristics and medical history along with biomarker measurements to produce risks of delivery with preeclampsia (PE) before any specified gestational age.[2] Compared with the risk of PE in nulliparous pregnant women, the risk is substantially increased in parous women with history of PE in their previous pregnancy and the risk is decreased in parous women with no history of PE. As shown in the Figure, the increase in risk in a woman with a history of previous PE is not constant but depends on the gestational age at delivery; similarly, the risk of PE in a woman with no previous history of PE is also dependent on the gestation at delivery. For example, compared with a nulliparous woman with a profile resulting in a risk for preterm PE of 1 in 100, a parous woman with the same characteristics and history of delivery with PE at 30 weeks' gestation would have a risk of about 1 in 10, and if the delivery was at 41 weeks' gestation, the risk would be 1 in 90. In a parous woman with the same characteristics as the nulliparous woman and previous delivery without PE at 30 weeks' gestation, the risk would be about 1 in 110, and if the delivery was at 41 weeks' gestation, the risk would be 1 in 700.

Longitudinal data on aspirin treatment and outcomes in successive pregnancies are needed to determine whether risks in the index pregnancy should be modified to account for treatment with aspirin in previous pregnancies. In the absence of such data, we carried out a sensitivity

FIGURE
Risk of delivery with preterm PE based on obstetrical history
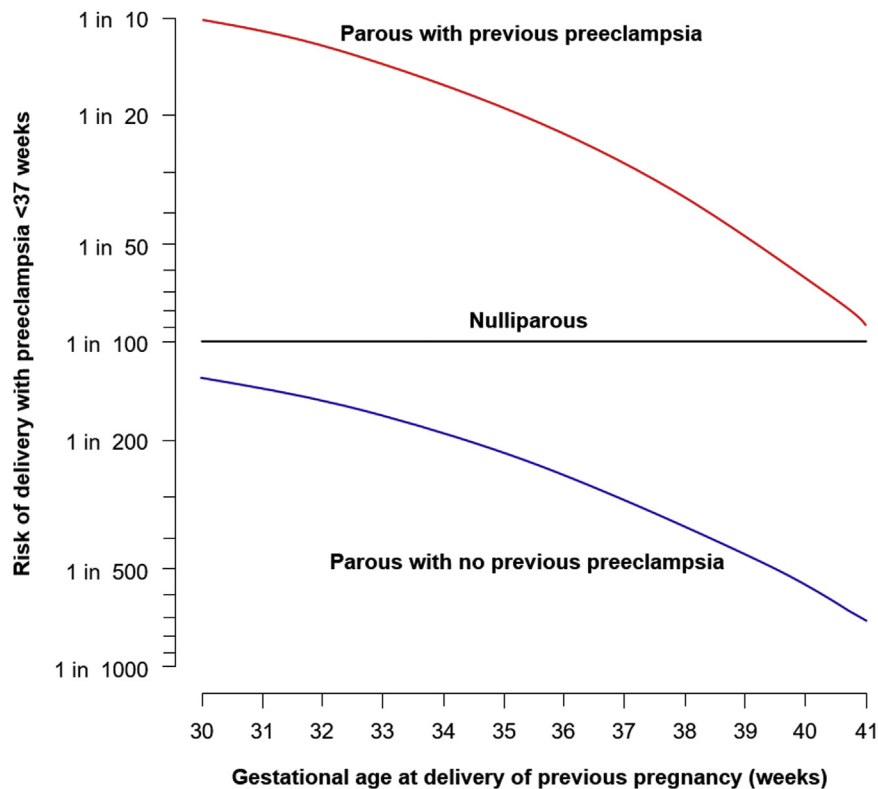
Compared with a nulliparous woman with a profile resulting in a risk of preterm PE of 1 in 100, the risk in a woman with previous PE is substantially increased, and the increased risk is dependent on the gestational age at delivery. The risk in a woman with no previous PE is substantially decreased, and the decreased risk is dependent on the gestational age at delivery.

PE, preeclampsia.

Wright. Competing risks model for prediction of preeclampsia. Am J Obstet Gynecol 2021.

analysis: changing the previous pregnancy history in the screening program for preeclampsia trial[3] data to reflect the effect of aspirin. We examined the following 3 policies:

1. Ignore aspirin prophylaxis in the previous pregnancy. This could result in a decrease in overall detection rate of 5% to 10% and a reduction in screen-positive rate of around 1%; in the subgroup that had received aspirin in their previous pregnancy, the decrease in detection rate could be as high as 40%.
2. Continue treatment with aspirin. All women treated with aspirin in their previous pregnancy because of increased risk of preterm PE, irrespective of whether they developed PE or not, should also be treated with aspirin in their current pregnancy; such a policy could result in doubling of women taking aspirin.
3. Consider women who received aspirin in their previous pregnancy as nulliparous. This may be the preferred option because it would result in only a small decrease (2%−3%) in overall detection rate and small increase (<1%) in screen-positive rate; in the subgroup that had received aspirin in their previous pregnancy, the decrease in detection rate could be as high as 10%. ■

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Competing risks model for prediction of preeclampsia in women who took aspirin prophylaxis in a previous pregnancy

We thank Professors Wright and Nicolaides for their detailed comment concerning our recent question about preeclampsia screening in parous women.[1,2]

Following the demonstration of the high performance of the competing risks model for the prediction of preeclampsia, associated with the significant efficacy of aspirin in the prevention of preterm preeclampsia in women identified with this model, we wished to address the question of how to manage women with a positive screening in their previous pregnancy who took aspirin accordingly.

We agree that the preferred approach would be to consider women who had received aspirin in their previous pregnancies as nulliparous, particularly those women who did not develop preterm preeclampsia. With the risk of preterm preeclampsia being relatively low in these women and the Fetal Medicine Foundation (FMF) algorithm model combining several biomarkers of preeclampsia aside from obstetrical history, we agree that performing the screening test would be a more efficient approach than recommending aspirin to these women. In addition, we agree with Professors Wright and Nicolaides that ignoring aspirin prophylaxis in the previous pregnancy could result in a decrease in overall predictive performance in this population. Considering these women as nulliparous for the early FMF preeclampsia screening would most likely provide similar prediction efficiency.

In the same line of thought and considering the role of the paternal effect in preeclampsia, we would also suggest that primipaternity be further considered in the overall preeclampsia risk calculation. In the current FMF algorithm, women with new partners should also be considered as nulliparous because a change of partner increases the risk of preeclampsia for women without a history of the condition.[3] ■

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