Evaluating trajectories of placental growth factor (PlGF) and pregnancy outcomes following multimodal screening for preeclampsia

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Objective. Multimodal screening with placental growth factor (PlGF) between 11-14 weeks' gestation is a better predictor of preeclampsia than clinical history alone. PlGF also accurately predicts preeclampsia up to 36 weeks' gestation. The objective of this study was to evaluate PlGF levels after multimodal screening to determine if different PlGF trajectories are associated with adverse pregnancy outcomes.

Materials and Methods. We linked data from a single centre first trimester multimodal preeclampsia screening and aspirin prophylaxis study between 30 October 2019 and 10 June 2021 with data from a parallel study evaluating PlGF during the second/third trimester. We used mixed effects models to examine different PlGF trajectories and time-to-event regression models to evaluate associations with pregnancy outcomes, including preterm birth and preeclampsia. We assessed effects of aspirin on PlGF trajectories and pregnancy outcomes.

Results. Of 1,057 patients enrolled in multimodal preeclampsia screening, 411 had additional PlGF testing in the second/third trimester. Repeat testing was associated with a high-risk screen result, previous preeclampsia, assisted reproductive technology, and older age. High-risk patients had lower PlGF levels at subsequent tests (β = -98.2 pg/mL; 95%CI -134.4 to -62.1; $p < 0.01$) and were more likely to deliver preterm (HR = 3.20; 95%CI 1.90-5.39; $p < 0.01$). Different trajectory patterns of PlGF were seen between groups, and PlGF was positively associated with gestational age at delivery.

Conclusions. Multimodal preeclampsia screening outcomes at 11-14 weeks' gestation are associated with distinct PlGF trajectories in the second/third trimester and clinical outcomes. These findings suggest PlGF trajectories can aid the prediction of adverse pregnancy outcomes.

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