22nd World Congress in Fetal Medicine

Fetal Medicine Foundation first trimester preeclampsia risk estimate: A window into long-term maternal cardiovascular health

Andersen MF, Riishede I, Hedermann G, Prahm KP, Vedel C, Pihl K, Pedersen NG, Skov HL, Nørgaard P, Sperling L, Rosenø N, Havers-Borgersen E, Rode L, Ekelund C

Copenhagen University Hospital, Rigshospitalet, Copenhagen, Denmark

Objective

Cardiovascular disease is the leading cause of mortality among women worldwide. It remains debated whether pre-eclampsia directly contributes to an increased cardiovascular risk, or whether it reflects an underlying predisposition due to suboptimal cardiovascular function. This uncertainty raises the question of whether a high-risk pre-eclampsia assessment in the first trimester may predict later cardiovascular dysfunction - even in women who do not go on to develop pre-eclampsia. We aim to investigate whether first trimester screening for pre-eclampsia, using the Fetal Medicine Foundation (FMF) algorithm, can function as an early risk stratification tool for future cardiovascular disease in women.

Methods

This register based cohort study includes data on 8,780 women who participated in the PRESIDE (PREeclampsia Screening In Denmark) study, linked with information from the Danish National Patient Registry. The PRESIDE cohort comprises pregnant women enrolled at six Danish hospitals between May 2019 and December 2020. Cardiovascular outcomes after pregnancy were identified using ICD-10 codes and prescription records indicative of cardiovascular disease in the period from 1996 to 2024. Subanalyses will categorize the timing of diagnosis into three intervals: during pregnancy, from delivery to six weeks postpartum, and beyond six weeks postpartum. Sensitivity analyses will be performed, stratified by specific types of cardiovascular disease. All analyses will be adjusted for the development of pre-eclampsia and for pre-existing cardiovascular disease prior to pregnancy.

Results

A complete first trimester risk assessment was available for 8,158 women (92.9%). The median age was 30.8 years (interquartile range [IQR]: 28.1–33.9). The majority of participants were Caucasian (94.9%), conceived naturally (90.3%), were non-smokers (97.0%), and only a small proportion had a pre-existing cardiovascular diagnosis at the time of the first-trimester scan (0.2%). Using the FMF screening algorithm and a screen positive rate of 10%, women at high risk for pre-eclampsia were identified. A total of 390 women (4.8%) received a cardiovascular diagnosis after inclusion in the PRESIDE study. Of these, 291 women (3.6%) were diagnosed during pregnancy or within six weeks postpartum, while 99 women (1.2%) received a diagnosis more than six weeks after delivery. Women classified as high risk for pre-eclampsia had significantly increased odds of developing cardiovascular disease (unadjusted odds ratio [OR]: 4.46; 95% confidence interval [CI]: 3.55–5.61) compared to women at low risk of pre-eclampsia. After adjusting for the development of pre-eclampsia and any prior cardiovascular disease, the OR was 2.96 (95% CI: 2.29–3.82). In an additional analysis restricted to diagnoses given more than six weeks postpartum, the unadjusted OR was 3.11 (95% CI: 1.96–4.92), and the adjusted OR was 2.23 (95% CI: 1.35–3.69).

Conclusion

Our findings indicate that a high first trimester pre-eclampsia risk estimate, based on the FMF algorithm, is associated with adverse maternal cardiovascular outcomes within five years after pregnancy independent of whether pre-eclampsia developed and regardless of any pre-existing cardiovascular conditions. These results underscore the importance of targeted cardiovascular monitoring and early preventive strategies in women identified as high risk for pre-eclampsia during pregnancy.