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Clinical implementation of combined first-trimester screening for preterm small-for-gestational-age

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Objective

In this study, we assessed the pregnancy outcomes and the performance of routine first trimester combined screening for preterm small for gestational age (SGA) using the FMF algorithm in a large cohort of women in Australia.

Methods

We undertook a retrospective study of de-identified prospectively collected screening data and pregnancy outcomes obtained through data linkage. We studied a large cohort of women with singleton births who underwent combined screening for both preterm preeclampsia and preterm SGA at 11–14 weeks of gestation between 2014 and 2017 in two large Fetal Medicine private prenatal screening practices in Melbourne, Victoria (six sites) and Sydney, New South Wales (ten sites), plus one public hospital Maternal-Fetal Medicine Unit in Sydney, New South Wales.

Results

A total of 22,841 singleton pregnancies underwent first trimester combined screening for preterm SGA, and 301,721 singleton pregnancies did not undergo screening. Women at high risk were more likely to have preterm SGA (2.8% versus 1.1%, RR 2.67, 95% CI 2.16-3.30) and other adverse pregnancy outcomes such as birthweight <3rd percentile, PE, and preterm birth. Women at low risk had significantly lower rates of measured outcomes in comparison to the unscreened women, including preterm SGA (0.5% versus 1.1%, RR 0.43, 95% CI 0.35-0.53). The overall prevalence of preterm SGA in the screened population was 0.8% (95% CI 0.7%-0.9%). First trimester combined screening detected 48.6% (95% CI 41.0%-56.2%) of the observed preterm SGA cases, at a false-positive rate of 13.0% (95% CI 13.4%-12.5%) and a negative predictive value of 99.5% (95% CI 99.4%-99.6%).

Conclusion

Implementation of first trimester combined screening with individual risk assessment for preterm SGA is feasible in clinical practice, demonstrates decent performance, and effectively stratifies women into high risk and low risk groups, helping to inform pregnancy management.