**Maternal cardiovascular function at 35-37 weeks' gestation: Normal vs Hypertensive disorders of pregnancy**

OBJECTIVE

To examine the effects of maternal characteristics and obstetric and medical history on maternal cardiovascular parameters at 35-37 weeks' gestation using bioreactance (NICOM). To examine the differences at 35-37 weeks' gestation in maternal cardiovascular parameters between normotensive versus those who develop hypertensive disorders of pregnancy. To investigate the potential value of combining maternal factors with multiples of the normal median values of maternal cardiovascular parameters at 35-37 weeks' gestation in the prediction of pre-eclampsia (PE) and gestational hypertension (GH).

METHODS

In 3013 singleton pregnancies maternal characteristics and medical history were recorded; uterine artery pulsatility index (UtA‐PI), mean arterial pressure (MAP) and maternal cardiovascular parameters were measured. In those who remained normotensive, multivariable regression analysis was used to determine significant predictors of the cardiovascular parameters among gestational age (GA), maternal characteristics and medical history. Multivariable logistic regression analysis was then used to determine if the maternal factors and maternal cardiovascular parameters made a significant contribution to predicting PE and GH. The performance of screening was determined by the area under receiver–operating characteristics curves.

RESULTS

Multivariable regression analysis demonstrated that significant independent prediction of maternal cardiovascular parameter including log10 cardiac output, log10 cardiac, log10 total peripheral resistance, log10 stroke volume, log10 MAP and heart rate, significant prediction was provided by GA, maternal characteristics and medical history. In pregnancies that subsequently delivered with PE or GH, total peripheral resistance and MAP were higher and maternal cardiac output was lower, mainly owing to a decrease in heart rate in PE and a decrease in stroke volume in GH. The increases in total peripheral resistance and MAP were inversely related to gestational age at delivery. The performance of screening for PE and GH achieved by maternal characteristics and medical history was improved by the inclusion of MAP, but not by UtA‐PI or maternal cardiovascular parameters.

CONCLUSION

Maternal cardiovascular parameters are affected by maternal characteristics and medical and obstetric history, and they should therefore be converted into multiples of the normal median adjusted for significant independent predictors before their inclusion in combined screening for PE. In women developing term PE total peripheral resistance and MAP are increased and maternal cardiac output is reduced. However, assessment of maternal cardiac function at 35–37 weeks' gestation is unlikely to improve the performance of screening for PE provided by maternal factors and MAP alone.