Cell-free fetal DNA as a predictor for preeclampsia

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Objective

The purpose of this study was to determine whether, in pregnancies that experienced PE, fetal fraction (FF) of cfDNA at early gestation is increased and whether this increase is related to the uterine artery pulsatility index (PI).

Methods

This is an observational prospective study of singleton pregnancies that underwent advanced prenatal screening for fetal trisomies through cfDNA, Panorama™ Test (Natera) or Harmony™ Prenatal Test (Ariosa Diagnostics), from January 2013 to March 2015. Chromosomal anomalies and uncompleted follow-up pregnancies were excluded. The measured FF was log10 transformed to make the distribution Gaussian. Regression analysis was used to examine the significance of the association between log10 FF and maternal (maternal age, body mass index -BMI-, parity, conception by reproduction technique, tobacco consume, race) and fetal characteristics (gestational age).

Results

The cohort included 461 pregnancies with a mean maternal age of 37 years (range 22-47) that underwent testing at a mean gestational age of 14. 2 weeks of (range 10-23). Regarding the indication, 80% were low-risk pregnancies. The average FF was 12. 8% (range 3. 5-27. 9). High risk, low risk, redraw rate were 0. 9%, 97. 6% and 1. 1%, respectively. No results were provided in 2 cases (0. 4%). There was a significant correlation between log10 FF and BMI (r=-0. 327, p<0. 001), but not with other factors. A 1. 6% rate of PE was observed. In pregnancies that experience PE, FF was not increased. There was an association between FF and uterine artery PI in PE cases (r =0, 273, p=0. 4), but not in normotensive cases.

Conclusion

This study is limited because the number of patients with PE is too low to draw firm conclusions. However, preliminary data shows that FF at early gestation was not increased in pregnancies that will develop PE. FF does not seem to be a predictor of this condition before 23 weeks of gestation. However, an association between FF and uterine artery PI was observed in PE cases, fact that deserves more future attention.

Outcome	n (%)	FF (median, interquartile range)			OR	95% CI
		Percent	MoM log FF	MoM log FF **		
Preeclampsia	6 (1.6%)	10.45 (9.4-11.9)	1.02 (0.97-1.08)	0.96 (0.91-1.00)	0.881	0.707-1.098
No preeclampsia	371 (98.4%)	12.80 (9.6-15.8)	1.11 (0.98-1.20)	1.01 (0.99-1.03)		

** corrected by BMI; FF: Fetal Fraction; MoM: Multiple of the Media; OR: Odds Ratio; CI: Confidence interval