Role of first trimester fetal growth as screening test for small for gestational age
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Objective
The aim of this study was to develop a predictive model for small for gestational age (SGA) using clinical and biophysical markers, such as crown-rump length (CRL) growth and uterine artery Doppler, during the first trimester of pregnancy.

Methods
This longitudinal study involved 2,144 women with a singleton pregnancy that had a CRL assessment before and after 11 weeks of gestation. A rate of CRL growth was calculated for each pregnancy and expressed as mm/day. Also, a transvaginal uterine artery Doppler (UtAD) assessment at 11+0-13+6 weeks was performed. There were 120 pregnant women enrolled during the first trimester who later develop SGA with or without preeclampsia (PE), including 37 that were classified as preterm (delivered <37 weeks) SGA. The distributions of UtAD and first trimester CRL growth were log transformed, adjusted for maternal clinical characteristics, expressed as MoM, and compared between groups. Logistic regression analysis was used to evaluate if any variable was significantly associated with all and preterm SGA outcomes.

Results
The rate of CRL growth during the first trimester of pregnancy in the 90% of the unaffected pregnancies was between 1.33 and 1.86 mm/day. Pregnant women who later delivered preterm SGA neonates were associated with body mass index, smoking habit and conception method, and were characterised by significantly increased MoM lower PI UtAD (1.45 [1.14-1.70] vs. 1.00 [0.82-1.21], p<0.05) and reduced CRL growth (0.92 [0.87-0.98] vs. 0.98 [0.91-1.08], p<0.05). Different combined models were generated by multivariate logistic regression analysis, being the DR, at a fixed 10% FPR, 32% for SGA and 53% for preterm SGA.

Conclusion
This study reported that slow rate of CRL growth during the first trimester of pregnancy is associated with SGA pregnancies, and confirmed that a combined model including maternal characteristics, CRL growth and uterine artery Doppler during the first trimester of pregnancy can predict about half of preterm SGA pregnancies.