Predictive model of small-for-gestational newborn without pre-eclampsia at 11+0 – 13+6 weeks

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Objective
To develop a predictive model of small for gestational age (SGA) newborn without pre-eclampsia (PE) during the first trimester of pregnancy.

Methods
A prospective longitudinal study was carried out in 6,068 patients that attended to an 11+0 - 13+6 weeks ultrasound scan at the Fetal Medicine Unit University of Chile Hospital. We identified 296 patients that subsequently delivered a SGA newborn (4.9%). SGA babies related with PE were excluded. There were 135 (45.6%) SGA newborns classified as under 5th centile. Mean, highest and lowest pulsatility index (PI) of uterine artery Doppler (UtAD) was also assessed. PI UtAD was logarithmic transformed, adjusted by clinical variables and expressed as a MoM of the unaffected group. Finally, to determine the better predictive model of SGA we used a multivariate analysis and a ROC curve was created.

Results
PI UtAD was adjusted by maternal age and CRL, and expressed as a MoM of the unaffected group. Clinical risk factors significantly related with SGA <10th percentile were decreased BMI (0.96 [0.94-0.99]), nulliparity (1.3 [1.1-1.7]) and chronic hypertension background (139.2 [17.3-1117.3]). Lowest-PI UtAD MoM was significantly related with SGA less than 10th centile (OR=2.4 [1.7 - 3.3]). With a fixed false positive rate of 10%, the predictive model based only in clinical factors demonstrated a sensitivity of 18%, but with the addition of UtAD the detection rate increases to 24%. This combined model for SGA <5th percentile without PE has a detection rate of 27%.

Conclusion
This study reports that first trimester detection rate of SGA newborns without PE is low, and other parameters such as new biophysical and/or biochemical parameters are needed to improve detection rate in the future. FONDECYT 1130668.