Prediction of intrauterine growth restriction by uterine arteries Doppler in the first trimester

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Objective
To associate the value of UAPI between 11-14 weeks of pregnancy with prediction of birth weight below the 10th and 5th percentile for gestational age, and those who require delivery before 37 weeks. The option to study isolated uterine arteries mean pulsatility index (UAPI) is because there are some centers that don’t have access to any prediction algorithm.

Methods
A retrospective, cross-sectional, observational study including 693 singleton pregnancies with evaluation of uterine arteries PI in the first trimester, from October 2010 to December 2013 in Maternidade Escola da Universidade Federal do Rio de Janeiro (ME-UFRJ). These patients have not used acetyl salicylic acid before 16 weeks of gestation and did not have neither chromosomic nor structural anomalies diagnosed. Outcomes data were recovered from medical records and classified as: newborns with birth weight below the 10th percentile (IUGR10) and 5th percentile (IUGR5) and with delivery before 37 weeks (IUGR<37). UAPI measurements were divided in groups and plot on a ROC (receiver operator characteristic) curve, to determine the test performance and set the value of UAPI corresponding to false positive rate of 10%. The area under curve (AUC) was calculated with its 95% confidence interval (CI). The test was considered good if inferior limit of 95%CI of AUC was greater than 0, 5. The study was approved by ethics committee.

Results
606 cases were considered normal with mean UAPI 1. 72 (1. 68-1. 76); 87 cases had IUGR10; and of these, 38 IUGR5; 9 IUGR10 <37 and 5 IUGR5 <37. The mean UAPI and its 95%CI were respectively 2. 02(1. 90-2. 14); 2. 12(1. 83-2. 42); 2. 05(1. 85-2. 26) and 2. 00(1. 46-2. 55). The cut off value of AUPI was 2. 4. The AUC and its 95%CI were 0. 66(0. 52-0. 80); 0. 65 (0. 62-0. 69) and 0. 64 (0. 60-0. 68) respectively for screening IUGR10; IUGR10<37; IUGR5 and IUGR5<37. Patients included in this sample started early prenatal care in an institution that follows strict clinical protocols, which excludes possible selection biases, and even that, the observed prevalence of IUGR was higher than those found by other authors. The average mean PI was higher in the group that developed the outcome of interest. Cases of IUGR<37 showed a large 95% confidence interval due to small number of cases in this subgroup. The performance of this test in predicting IUGR was positive with AUC > 0. 5 in associations studied. However, it was not entirely satisfactory because there are intersection of UAPI values between normal and pathological pregnancies, which reflects the low sensitivity of its individual use. The test correctly classified 80% to 90% of the sample, with high specificity, as 90% of normal pregnancies have values below 2. 4. The benefit to be achieved with the early identification of risk for IUGR is to establish clinical protocols to ensure proper fetal follow up at third trimester, to optimize perinatal outcomes.

Conclusion
UAPI in the first trimester of pregnancy was associated to prediction of IUGR. The value associated with its outcome was 2. 4.