

The uterine artery Doppler between 11 to 14 weeks of pregnancy in pre-eclampsia prediction

Rezende KBC, Pereira MR, Bornia RBG, Marzano MOC, Andrade RP, Pritsivelis C, Amim Jr J, Edson Chaves Faleiro
 Maternidade Escola Da Universidade Federal Do Rio de Janeiro, Rio de Janeiro, Brazil

Objective

To obtain the value of uterine arteries mean pulsatility index (UAPI) between 11-14 weeks gestation which is associated with preeclampsia requiring delivery before 34, 37 and 42 weeks gestation. The study of UAPI as only parameter is reproducible and can be performed by a single sonographer at centers that don't have access to prediction algorithms.

Methods

Retrospective, cross-sectional, observational study including 786 singleton pregnancies with evaluation of the UAPI in the first trimester of pregnancy from October 2010 to December 2013 at the Maternidade Escola da Universidade Federal do Rio de Janeiro (ME-UFRJ). The study outcome was: patients who developed preeclampsia that required delivery before 34, 37 or 42 weeks of gestation. The distribution of mean UAPI in groups was tracked and receiver operator characteristic (ROC) curve was built to determine the performance of test and set the value of UAPI corresponding to false positive (FP) rate of 10% and 20%.

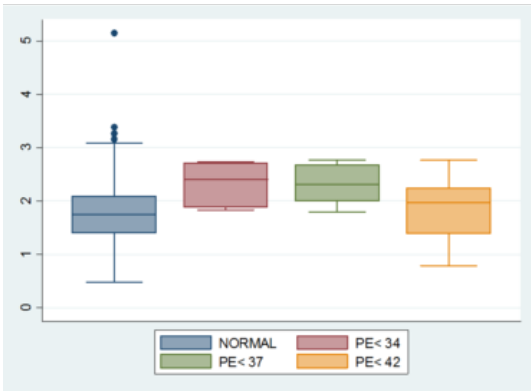
Results

65 patients developed PE (mean UAPI 1.86) and 693 did not (mean UAPI 1.76). PE cases: 6 had PE <34 (mean UAPI 2.32); and 14 patients developed PE <37 weeks (mean UAPI 2.31). The areas under ROC curve (AUC) were 0.80; 0.81; 0.56 respectively for PE <34, PE <37 and PE <42. The UAPI values of those who developed PE and normal group in our sample are superimposed. However, the average and the confidence interval(IC) 95% are significantly higher in the clinical forms of PE that required delivery before 34 and 37 weeks gestation. These groups are the subject for early prediction and prophylaxis to mitigate the taxes of prematurity or even prevent the onset of disease. Cases of PE <34 showed IC95% wide due to the small number of cases in this subgroup. The performance of the test in predicting PE was positive with AUC > 0.5 in all associations, however, was not satisfactory because of intersections in UAPI values in both normal and pathological pregnancies, which reflects the low sensitivity of its individual use. The value of 2.45 corresponded to FP rate of 10% with a sensitivity of 50%; 42% and 15% for PE <34, <37 and <42 respectively. For PE <34 and <37, there was excellent performance in terms of accuracy, specificity and AUC.

Conclusion

The performance of the isolated UAPI measurement is moderate for predicting PE that demand interruption before 34 and 37 weeks, and inefficient for PE prediction that demand interruption before 42 weeks, with 2.45 and 2.20 medium PI representing 10% and 20% false positive rates respectively.

Figure 1 - BOXPLOT FROM MEAN UTERINE ARTERY FROM NORMAL PATIENTS AND PATIENTS WHO DEVELOP PE ACCORDING GESTATIONAL AGE AT DELIVERY



UTERINE ARTERY MEAN PI ROC CURVES FROM PATIENTS WHO DEVELOP: a) PE < 34, b) PE < 37 e c) PE < 42

