

First trimester growth velocity and type of conception in the prediction of small for gestational age

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Objective

The aim of the study is to produce a predictive model of birthweight including early growth velocity (vCRL), maternal characteristics, type of conception, uterine Doppler, and biochemistry (PAPP-A and bhcg). We were also interested in the differences between growth velocity according to type of conception.

Methods

This is a cohorts study of a single center including all pregnancies with an early scan at 8-9 wks and the 12 wks scan. The vCRL was calculated substracting the CRL 12-CRL 8 divided by days (mm/d). The other variables included in the algorithm were mom uterine Doppler, mom PAPP-A, mom bhcg, maternal weight and height, smoking habit. The type of conception was classified as: spontaneous, IVF, frozen embryo cryotransfer, and egg donation. A logistic regression model including all the variables was used to create the prediction algorithm of the birthweight. Also the detection rate of SGA at term and preterm was calculated.

Results

5079 singleton pregnancies were included, 86, 7 % (4947) spontaneous and 13. 3 % (762) Assisted Reproductive Techiniques (ART). The mean vCRL was 1. 66 mm/d in the spontaneous and 1. 68 mm/d in the ART group. (p 0. 003). This statistical significance was lost when we compared the zcore of birthweight among the two groups. (p 0, 09). Comparing the different types of conception was significant the difference between the frozen cryotransfer groups with higher vCRL compared to the other groups. Regarding the predictive model the significant variables were: smoking, maternal weight and height, uterine Doppler, Papp-A and bhcg and vCRL, The more significant variables in the model were smoking and uterine Doppler with a negative impact and vCRL as positive. The ROC curve of the entire model has an AUC of 0. 68 (0, 66-0, 70). The detection rate of the model for a 10 % false positive for any SGA was 31 %, for SGA below 37 wks was 38, 5 % and below 35 wks 46. 7 %.

Conclusion

Adding the vCRL to a model with maternal characteristics and placental function permits to detect half of the SGA below 35 weeks. There is no relevant impact according to the type of conception in the final model.