The role of umbilical vein blood flow assessment in the prediction of foetal growth: a prospective observational cohort study

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Objective. To evaluate the umbilical vein blood flow volume (UV-Q) in SGA foetuses and in FGR, and to explore the correlation between UV-Q and foetal growth velocity (FGV). Secondly, the capacity of UV-Q and FGV in predicting adverse perinatal outcome (APO) and iatrogenic preterm birth were assessed.

Materials and Methods. 122 women were enrolled (64 SGA and 58 FGR according to Delphi consensus criteria). At the time of diagnosis foetal biometry and Doppler assessment, including absolute UV-Q and normalized for estimated foetal weight (UV-Q/EFW) and abdominal circumference (UV-Q/AC) were considered. The FGV was calculated from the difference between the EFW calculated in two consecutive sonographic evaluations. The pregnancies were followed until delivery and maternal-neonatal outcomes were collected.

Results. When compared to SGA and reference ranges, FGR had significantly lower UV-Q, UV-Q/EFW, and UV-Q/AC. The FGV had a positive significant correlation with UV-Q (r = 0.46), UV-Q/AC (r = 0.43), and BW (r = 0.56).

The multivariable logistic regression analysis showed that UV-Q ≤ 0.65 MoM (aOR = 3.5) and FGV ≤ 0.63 MoM (aOR = 3.0) were independently associated with the occurrence of APO; UV-Q ≤ 0.60 MoM (aOR = 5.2) and FGV ≤ 0.63 MoM (aOR = 3.6) were independent predictors of iatrogenic preterm birth. This was true both for SGA and FGR.

Conclusions. The UV-Q might have a potential role in identifying foetuses with FGR and to predict foetal growth at the subsequent biometric evaluation. UV-Q and FGV are independent predictors of iatrogenic preterm birth and APO in a population of small foetuses, regardless of Delphi consensus criteria. These results encourage future studies on the predictive value of this parameter.