Fetal Doppler parameters as predictors of fetal cardiac function in late-onset fetal growth restriction (FGR): a prospective study

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Objective. The aim of the study was to evaluate the relationship between fetal Doppler parameters and functional echocardiography in a population of late-onset growth restriction fetuses (LFGR).

Materials and Methods. A single center prospective study including a consecutive series of non-anomalous singleton pregnancies with suspected LFGR. During routine follow-up, the assessment of fetal Doppler (umbilical artery (UA) and middle cerebral artery) was performed. Moreover, two-dimensional clips of the four-chamber view of the fetal heart were prospectively collected. The cohort population was divided into two groups: LFGR with normal UA Doppler (Group I) and LFGR with UA > 95°P (Group II). One dedicated operator effected a speckle tracking functional echocardiography with TomTec Gmbh software.

Correlation between Doppler parameters and the fetal cardiac indexes was described with cross-sectional analysis.

Results. 17 cases fulfilling the eligibility criteria were included, and 61 cross-sectional measurements were analysed. A significantly higher Ejection Fraction (EF) (60 vs 55.1, p = 0.03) and Left Ventricle (LV) circumferential strain (-31 vs -25.7, p = 0.04) was found in group I compared with group II. A sub-analysis on a selected population of fetuses with a weight between the 3rd and the 10th percentile at birth was also performed. A significantly reduced LV global longitudinal strain (-18.6 vs -21.9, p = 0.01), LV global radial strain (-31.1 vs -47.5, p = 0.003), LV global circumferential strain (-24.4 vs -31.6, p = 0.03) and EF (52.5 vs 60.2, p = 0.004) was reported in Group I compared with Group II.

Conclusions. In a population of LFGR fetuses, a relationship was demonstrated between the UA Doppler and the left ventricular function.