Postpartum maternal cardiac adaptation in smallness-for-gestational age (SGA) pregnancies and its correlation with biomarkers of cardiovascular risk

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Objective. To evaluate in women at high risk for placental insufficiency maternal cardiac geometry adaptation from the early-third trimester to 6 months postpartum (6MPP), by the occurrence of smallness-for-gestational age (SGA), and to assess the correlation between the maternal cardiac adaptation and cardiovascular biomarkers.

Materials and Methods. A high-risk placental insufficiency cohort was prospectively evaluated at 28 weeks and 6MPP using echocardiography. Structural cardiac parameters included left atrium (LA) and ventricle (LV) volumes, and septum and posterior LV wall thickness. Cardiovascular risk biomarkers were collected at 6 MPP including a lipidic profile, VCAM-1, and NT-proBNP. SGA was defined as birthweight < 10th centile (local curves).

Delta values (28 weeks – 6 MPP) were compared by quantile regression between SGA and AGA, adjusted by maternal BMI. Spearman correlation was performed between cardiac morphometry changes and biomarkers.

Results. 62.3% women were initially nulliparous. Mean maternal age was 35.6 years (SD 4.6).

No significant differences were found in LA and LV volumes between groups. SGA pregnancies had significantly lower BMI-adjusted delta values of the septum thickness (-0.06 *vs* 0.07 mm; p = 0.003), LV posterior wall thickness (-0.078 *vs* 0.138 mm; p = 0.026), and LV mass (-3.55 *vs* 27.81 g; p = 0.002). LV posterior wall thickness at 6 MPP was negatively and significantly correlated with HDL and Apolipoprotein A1 levels whereas a positive significant correlation was found with TG/HDL ratio.

Conclusions. SGA pregnancies exhibited at 6 months postpartum increased LV posterior wall and septum thicknesses, and this finding correlated with an impaired lipid and atherogenic profile.