Longitudinal maternal bioimpedance analysis in pregnancies complicated by hypertensive disorders and/or foetal growth restriction

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Objective. To study across-pregnancy maternal body composition by bioimpedance analysis (BIA) in pregnancies complicated by hypertensive disorders (HDP) and foetal growth restriction (FGR).

Materials and Methods. Singleton pregnancies, enrolled at the combined first trimester screening test, underwent maternal BIA at each trimester of pregnancy. According to the pre-existing or pregnancy-related occurred complications, women were finally classified distinguishing pregnancies complicated by HDP, isolated FGR (i-FGR), HDP combined with FGR (HDP-FGR) and uneventful pregnancies (controls). A longitudinal Bayesian multivariate mixed-effects model was performed.

Results. In a cohort of 519 patients, 24 cases of chronic hypertension (CH), 19 HDP with appropriate-for-gestational-age foetus (HDP-AGA), 3 HDP-FGR, 12 i-FGR and 40 controls, randomly sampled from the entire uncomplicated pregnancy cohort, were analyzed. Pre-pregnancy body mass index (BMI) was significantly higher in both HDP-AGA and CH than controls. Total body water (TBW), lean body mass (LBM) and visceral fat (VF) showed the same trend in all groups, with an average increase from first to second trimester [+1.84 (95%CI 1.13-2.53); +2.55 (95%CI 1.61-3.50); +0.71 (95%CI 0.06-1.36), respectively], and from first to third trimester [+3.26 (95%CI 2.57-3.97); +4.48 (95%CI 3.56-5.43); +1.27 (95%CI 0.62-1.92), respectively]. No statistically significant differences of TBW, LBM and VF were found among groups, once the bioimpedance parameters were corrected for pre-pregnancy BMI and gestational age at evaluation.

Conclusions. Maternal bioimpedance parameters show a progressive increase across pregnancy in both uncomplicated and pathological pregnancies. Moreover, HDP-AGA and CH are characterized by higher pre-pregnancy BMI, TBW, LBM and VF, a proxy of metabolic syndrome.