

Longitudinal changes oxidative stress markers and uterine arteries impedance in pregnancies complicated by hypertensive disorder of pregnancy and foetal growth restriction

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Objective. To study across pregnancies complicated by hypertensive disorders of pregnancy (HDP) and fetal growth restriction (FGR) biochemical and biophysical changes.

Materials and Methods. Singleton pregnancies underwent uterine artery Doppler and a blood sFlt-1/PIGF ratio determination during each trimester of pregnancy. Women were grouped according to the pregnancy outcome: HDP, FGR, uneventful pregnancies. A longitudinal Bayesian multivariate mixed-effects model, corrected both for pre-gestational BMI and gestational age at diagnosis, was performed.

Results. 519 patients were enrolled. Preliminary data from 24 chronic hypertension (CH), 19 HDP with appropriate-for-gestational-age foetus (AGA), 3 HDP-FGR, 12 isolated FGR (i-FGR) and 40 controls, randomly sampled from the entire cohort were analysed.

Mean sFlt-1/PIGF and uterine arteries Pulsatility Index (UtA-PI) showed the same trend in all groups, with an average decrease from first to second trimester [-1.71 (95%CI -1.91 to -1.53); -0.85 (95%CI -0.94 to -0.76), respectively], and from first to third trimester [-0.86 (95%CI -1.06 to -0.68); -0.97 (95%CI -1.06 to -0.88), respectively].

In the three trimesters, the longitudinal changes of sFlt-1/PIGF ratio showed a significant increase in HDP-FGR, i-FGR and HDP-AGA groups (1.68, 95%CI 0.84-2.50; 0.49, 95%CI 0.02-0.96; 0.55, 95%CI 0.10-0.97), respectively. Mean UtA-PI showed a significant increase in HDP-FGR and i-FGR groups (+0.27, 95%CI 0.10-0.43 and +0.45, 95%CI 0.16-0.75).

Conclusions. Pregnancies complicated by HDP-FGR and i-FGR show an altered UtA-PI and sFlt1/PIGF ratio as a proxy of placental insufficiency, while HDP-AGA presents an intermediate oxidative stress based on higher sFlt-1/PIGF value.