Correlation between maternal haemodynamics and foetal growth velocity in physiological singleton pregnancies

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Objective. In uncomplicated pregnancies, cardiac output (CO) changes through trimesters are positively associated with neonatal weight. The aim of this study was to investigate the relationship between maternal haemodynamic parameters and foetal growth velocity in different stages of pregnancy.

Materials and Methods. This was a prospective observational study that included 58 physiological singleton pregnancies. Patients were enrolled in the first trimester and underwent haemodynamic assessment with Ultrasonic Cardiac Output Monitor (USCOM) at 12, 20, 30 and 35 gestational weeks. Ultrasound assessment of foetal biometry and Doppler velocimetry was performed at 20, 30 and 35 weeks. Data were analysed with a univariate linear regression model.

Results. The model for the estimated foetal weight (EFW) daily increase (grams) between 20 and 30 gestational weeks showed an increase in foetal growth velocity for each unitary increase of maternal CO (coeff 0.52, $p = 0.031$). The rise was even more significant between 30 and 35 gestational weeks (coeff 2.44, $p = 0.005$) together with inotropy (coeff 9.14, $p = 0.04$). Also Stroke volume (SV) and umbilical vein blood flow were directly related to EFW daily increase (coeff 0.019 and 0.06, $p = 0.025$ and 0.03), although the impact in the same time lapse was inferior.

Conclusions. This study remarks the influence of maternal haemodynamics in determining foetal growth velocity, especially during the third trimester of pregnancy.