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TITLE: Fetal and neonatal left ventricular torsion in normal, growth restricted and diabetic pregnancies.

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ABSTRACT BODY:

Objectives: To evaluate fetal and neonatal left ventricular (LV) rotational mechanics in normal, growth restricted and diabetic pregnancies at term.

Methods: Prospective study of 107 pregnant women at term included three patient groups: normal (n=54), small for gestation (SGA, n=33) and gestational diabetes (GDM, n=20). In each pregnancy, paired fetal and neonatal LV rotation data derived by 2D speckle tracking imaging in short axis views at the base and apex of the heart were obtained few days before the onset of labor and within hours of birth. Linear regression analysis was used to examine the relation of LV torsion with various fetal and neonatal cardiac and Doppler indices.

Results: The results demonstrated 3 unique patterns of LV twist, from the lowest values of LV torsion (Pattern 1), which was significantly associated with impaired systolic and diastolic functional indices, through to the highest values of LV torsion (Pattern 3) with a strong correlation to increased myocardial and chamber function. LV torsion values were significantly lower ($p < 0.05$) in growth restricted (fetus 1.9 deg/cm, neonate 1.5 deg/cm) compared to the normal pregnancy (fetus 2.5 deg/cm, neonate 2.1 deg/cm). In contrast, diabetic pregnancies showed significantly higher ($p < 0.05$) values of LV torsion (fetus 4.7 deg/cm, neonate 2.8 deg/cm).

Conclusions: There are unique perinatal patterns of LV twist that are correlated to indices of ventricular geometry, myocardial performance and cardiac function. Differences in LV torsion may reflect compensatory adaptation to the physiological environment of term pregnancy, as well as adverse conditions of growth restriction and maternal diabetes.

Additional details

KEYWORDS: Fetal cardiac function, Diabetes, Intrauterine growth restriction, Echocardiography.

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