

FGR: Metabolic and cardiovascular profile at 3-4 years

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Objective

To ascertain the relation between an anti-angiogenic status during fetal life and cardiac function and endothelial disease in a cohort of fetal growth restriction (FGR) children at 3-4 years of age.

Methods

40 children diagnosed of FGR and followed until 3-4 years of age were included in the study. FGR severity was defined according to prenatal hemodynamic parameters. 25 controls matched for gestational age at delivery were included. At delivery, maternal, perinatal outcome and cord blood samples were obtained. Anthropometric data, metabolic parameters and cardiac function were evaluated at 3-4 years. sFlt-1, sEng, PIGF, ADMA, lipid profile, MDA, cTnT, NT-pro-BNP were measured in cord blood and at 3-4 years.

Results

Mean gestational age at delivery was 32weeks. The most severe FGR fetuses have an increased neonatal morbi-mortality, greater anti-angiogenic status at birth, less postnatal catch-up growth and a profile of plasma biomarkers in cord blood and at preschool age compatible with subclinical cardiovascular impairment and increased oxidative stress (higher levels of NT-pro-BNP and MDA) with poorer cardiac function according to higher values of right and left Tei Index. A correlation was found between sFlt1 levels at birth and left and right ventricle tissue Doppler Tei Index ($r=0.7890$ and $r=0.7505$, $p<0.001$, respectively). In contrast, less severe IUGR children, perform postnatal catch-up growth, have a more central distribution of body fat at 3-4 years and showed plasma biomarkers associated with metabolic risk but normal cardiac performance.

Conclusion

Our data suggest distinct metabolic and cardiovascular risk in early childhood according to fetal growth restriction severity.