

Predicting pregnancy outcomes: small or early?

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Being born small or early clearly has important implications for lifelong human health. Placental differentiation and function are essential for optimal fetal growth and development and when impaired predispose the pregnancy to a variety of complications including intrauterine growth restriction (IUGR) and pre-term birth (PTB). The challenge is to identify women in early pregnancy who are at risk so that interventions can be made early enough to improve placentation. We recruited 3234 nulliparous women before 15 weeks gestation in Adelaide and Auckland. Both parents were Caucasian in 2123 pregnancies. Blood samples were collected and DNA extracted from mother-father-baby trios. Genotyping of single nucleotide polymorphisms (SNPs) in genes that affect placental development and maternal adaptation to pregnancy and logistic regression analyses have identified a number of SNPs in VEGF family, renin angiotensin (RAS) family and IGF family genes that interact with the environment to predict risk for IUGR and PTB. Furthermore, fetal sex affects the association of RAS genes in pregnancy outcome, with the female fetus being at risk in particular. Maternal socioeconomic status, diet and BMI interact with SNPs to influence risk. This research has identified genetic and lifestyle factors that may be amenable to future intervention and simple modification.