

RISK FACTORS

Poor foetal growth linked with childhood cardiovascular risk

Impaired foetal growth during the first trimester of pregnancy is associated with an increased prevalence of cardiovascular risk factors in childhood. This finding comes from a prospective, population-based analysis, which was part of the Generation R study conducted in the Netherlands.

The early development of the cardiovascular system occurs during the embryonic phase. “Thus, cardiovascular disease may have at least part of its origins in the first trimester of pregnancy or even the preconception period,” write Jaddoe *et al.* who have published their report in the *BMJ*. The investigators show, for

the first time, that foetal crown-to-rump length measured between 10 weeks and 13 weeks 6 days gestation is associated with childhood cardiovascular risk.

The study population comprised 1,184 women with a pregnancy of known gestation, who underwent foetal crown-to-rump measurement at the end of the first trimester, and who gave birth to a live, single child. These children were followed up until the age of 6 years. The mean foetal length was 61 mm (SD 11 mm).

Children in the lowest quintile of first trimester foetal crown-to-rump length were found to have more total body fat, a higher android/gynoid fat mass ratio, and increased diastolic blood pressure and total-cholesterol level than children in the highest quintile ($P < 0.05$ for all). Low foetal length was not associated with BMI, systolic blood pressure, or levels of insulin or triglycerides in childhood. These associations between foetal size and the presence of risk factors were not affected by statistical adjustment for maternal factors, such as age, smoking status, blood pressure, BMI, or use of folic

acid supplements. Neither were the results altered by factors related to the child, such as sex, birth weight, or BMI at 6 years of age.

“The results from this study ... suggest that the first trimester might be a critical period for cardiovascular and metabolic function,” conclude the authors. “However, ... the observed effect estimates were small and reflect subclinical changes”. Jaddoe *et al.* also acknowledge that “the large number of statistical tests ... may have led to false positive associations”. The study is observational in nature, and the reasons or mechanisms for an association between poor early foetal growth and cardiovascular risk are unknown. However, the findings suggest that future strategies targeted towards women in early pregnancy might help prevent future cardiovascular disease in their unborn child.

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Original article Jaddoe, V. W. *et al.* First trimester fetal growth restriction and cardiovascular risk factors in school age children: population based cohort study. *BMJ* 348, g14 (2014)



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