

Study identifies factors associated with growth of fetus in first trimester and subsequent outcomes

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Factors such as maternal high blood pressure and high hematocrit levels (the proportion of blood that consists of red blood cells) are associated with a greater likelihood of restricted fetal growth during the first trimester, with restricted growth linked to an increased risk of preterm birth and low birth weight, according to a study in the February 10 issue of *JAMA*.

"Human growth and development rates are highest during the first trimester of pregnancy, when essential fetal organ development is completed. Adverse first-trimester fetal exposures might have permanent consequences for fetal and postnatal health," the authors write. "The influences of maternal physical characteristics and lifestyle habits on first-trimester fetal adaptations and the postnatal consequences are not known."

Dennis O. Mook-Kanamori, M.D., M.Sc., of Erasmus Medical Center, Rotterdam, the Netherlands, and colleagues examined the association of several maternal physical characteristics and [lifestyle habits](#) in 1,631 mothers with first-trimester [fetal growth](#) and the associations of first-trimester fetal growth restriction with the risks of adverse birth outcomes and accelerated postnatal growth until the age of 2 years. Mothers were enrolled in the study between 2001 and 2005. First-trimester fetal growth was measured as fetal crown to rump length by ultrasound between the [gestational age](#) of 10 weeks 0 days and 13 weeks

6 days.

The researchers found that maternal age was positively associated with first-trimester fetal crown to rump length and that higher diastolic blood pressure and higher hematocrit levels were associated with shorter crown to rump length. Compared with mothers who were nonsmokers and optimal users of folic acid supplements, those who both smoked and did not use folic acid supplements had shorter fetal crown to rump lengths.

"Compared with normal first-trimester fetal growth, first-trimester growth restriction was associated with increased risks of preterm birth (4.0 percent vs. 7.2 percent), low birth weight (3.5 percent vs. 7.5 percent), and small size for gestational age at birth (4.0 percent vs. 10.6 percent)," the researchers write. They also found that shorter first-trimester crown to rump length was associated with accelerated growth rates in early childhood.

"Further studies are needed to assess the associations of first-trimester growth variation on the risks of disease in later childhood and adulthood," the authors conclude.

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