

Delivery of a small full-term infant puts mothers at risk for heart disease

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Delivering a full-term baby of small birth weight has been shown to be an independent indicator of later heart disease for the mother, and as equivalent in risk as high blood pressure and diabetes. Researchers at the University of Texas Medical Branch (UTMB) at Galveston further report that the odds of ischemic heart disease (IHD) among women whose full-term babies are small for their gestational age (SGA) are twice that of other women.

This discovery, published in the March 14th issue of *PLoS One*, confirms and sheds light on the suspected association between SGA infants, who account for approximately 10 percent of births, and increased maternal risk for IHD. Until now, researchers believed any link was due to common genetic or environmental factors or to overall poor health.

"What we found instead is that pregnancies that produce SGA infants may trigger long-term cardiovascular changes that increase the mothers' risks for [heart disease](#)," said Dr. Radek Bukowski, professor of [obstetrics and gynecology](#) in the Division of Maternal-Fetal Medicine at UTMB. "If future research confirms [birth weight](#) as a solid predictor, we will have a low-cost, effective method to improve identification of [women](#) at risk and potentially help prevent heart disease decades before women experience trouble."

Heart disease is the leading cause of death among American women, killing one in three each year; more than 42 million U.S. women are living with cardiovascular disease. Even though almost half of all women

will develop IHD in their lifetime, current risk-estimation models classify 95 percent of women under age 70 as low-risk.

The researchers analyzed a nationally representative sample of more than 6,600 women who participated in The National Health and [Nutrition Examination Survey](#) (NHANES) between 1999 and 2006. SGA was self-reported and defined as giving birth at or after 37 weeks of gestation to an infant weighing less than five pounds, eight ounces (2,500 grams).

The survey collected information about the women's own history of IHD, stroke, hypertension, diabetes and cancer; family histories of the same disorders; IHD risk factors, including: race and ethnicity, education, marital status, income, smoking status, alcohol use, dietary fiber intake, body mass index, activity levels and triglyceride and cholesterol levels; and age at time of last birth and at IHD diagnosis.

The relative odds for IHD were almost two-fold higher (9.6 percent versus 5.7 percent) in women who delivered a SGA infant. Further, having a SGA baby was as strong a risk factor as having hypertension or diabetes.

"We were especially surprised that when we adjusted for family medical history and known risk factors, such as smoking – which significantly increases the risk of heart disease and low birth weight infants – SGA remained a powerful independent risk factor for heart disease in the mothers," said Bukowski.

While cautioning that any explanation for this effect is speculative at this point, Bukowski suggested it could be due to low concentrations of angiogenic factors (which stimulate blood vessel growth and repair), such as placental growth factor in maternal circulation. Placental growth factor has been shown to stimulate blood-vessel development and repair in the heart; a deficiency could decrease this process and permanently

affect coronary circulation, resulting in IHD later in life.

This possibility is supported by studies that have shown that preeclampsia, a placental disorder during pregnancy that is also associated with SGA, results in impaired vascular function and increases the risk of future hypertension and heart disease.

"SGA deliveries could allow for early intervention and prevention for heart disease. If this link is proven, doctors could look out for women who deliver smaller than average babies and provide education and preventative care, which would be especially important in resource-poor countries," said Dr. Bukowski. "It could also be used years after childbirth, as most women remember their babies' birth weight quite accurately."

More information: Bukowski R, Davis KE, Wilson PWF (2012) Delivery of a Small for Gestational Age Infant and Greater Maternal Risk of Ischemic Heart Disease. PLoS ONE 7(3): e33047. doi:10.1371/journal.pone.0033047

Provided by University of Texas Medical Branch at Galveston

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