

IUGR Infants May Be at Risk for Atherosclerosis

BY PATRICE WENDLING

HAMBURG, GERMANY — The environment experienced in utero was found in two small studies to influence the development of later cardiovascular disease and even perinatal death.

“We found that in fetuses and neonates with intrauterine growth restriction, aortic intima media wall thickness is increased with respect to controls, suggesting that it may represent an in utero marker of potential atherosclerosis development,” lead author Dr. Erich Cosmi said at the World Congress on Ultrasound in Obstetrics and Gynecology.

Doppler ultrasound revealed that maximum abdominal aortic intima media thickness (aIMT) was significantly increased in 25 infants with intrauterine growth restriction (IUGR), compared with 25 controls, at a mean gestational age of 32 weeks (2.05 mm vs. 1.05 mm) and at a mean of 18 months after birth (2.3 mm vs. 1.06 mm).

Blood pressure values were also significantly correlated with prenatal and postnatal aIMT values, reported Dr. Cosmi of the department of obstetrics and gynecology, University of Padua (Italy). Systolic blood pressure was 123 mm Hg in IUGR infants and 104 mm Hg in controls, which was significantly different at a *P* value of .0004.

When asked by the audience if any of the infants were on hypertension medication at the time of evaluation, Dr. Cosmi responded, “No, but they are now. We didn’t know they would have hypertension. It was surprising for us.”

The researchers also assessed renal function after birth, as previous research in animal models suggests a renal contribution to developmentally programmed hypertension.

Compared with controls, IUGR infants had significantly higher urinary microalbumin (4.4 mg/L vs. 10.7 mg/L) and sodium (56 mmol/L vs. 122 mmol/L) levels and albumin/creatinine ratios (14.7 mg/g vs. 26.9 mg/g). All are markers of glomerular function.

Kidney length and volume were similar, as were levels of lysozyme, a marker of tubular function.

“The clinical implications of this study are that fetuses that were IUGR necessitate follow-up after birth, as they are at risk for cardiovascular disease,” Dr. Cosmi said in an interview.

Fetuses were classified as IUGR if their estimated fetal weight was below the 10th percentile with Doppler velocimetry greater than 2 standard deviations.

In a separate study presented during the same session, Dr. Elisenda Eixarchof the University of Barcelona reported that perinatal death in preterm IUGR fetuses is associated with the presence of markedly abnormal myocardial function before delivery and biomarkers of myocardial cell damage in cord blood.

Among 59 IUGR fetuses, the 8 fetuses who died as compared with survivors had significantly worse myocardial performance index z scores (2.5 vs. 1.7), left

E/A (ratio of peak velocity during early diastolic filling to peak velocity during atrial contraction) z scores (2.4 vs. 0.8), and right E/A z scores (2.3 vs. 1). Only cardiac output was not significantly different at 816 mL/min per kilogram in those who died and 750 mL/min per kilogram in survivors.

Significant increases were also observed in fetuses who died versus survivors in B-type natriuretic peptide (350 pg/mL vs. 64 pg/mL), heart-type fatty acid-binding protein (23 mcg/L vs. 11 mcg/L), and troponin I levels (0.07 ng/mL vs. 0.02 ng/mL). ■

VITALS

Major Finding: Abdominal aortic intima media thickness was significantly greater in infants with IUGR than in controls, as was blood pressure, in one small study. In a second study of 59 IUGR fetuses, fetal ultrasonographic cardiovascular indices were significantly worse in the fetuses that died compared with survivors.

Data Source: The first study involved 25 infants with IUGR and 25 controls, while the second included 59 IUGR fetuses, in which the 8 fetuses that died were compared with survivors.

Disclosures: None reported.



THEIR LOOKS MAY NOT REFLECT THEIR FOLATE INTAKE

It's hard to know when women are getting enough folate. And risky to assume they'll take a supplement.

Why is identifying folate deficiency so critical? Because folate deficiency in women of childbearing age is associated with the development of neural tube defects (NTDs) in their unborn children. Neural tube closure occurs as soon as 4 weeks after conception, before many women realize they are pregnant.¹

Nutrition alone may not be enough

To reduce the risk of NTDs, the Centers for Disease Control and Prevention (CDC) and the March of Dimes recommend that all women of childbearing age consume 400 mcg of folic acid daily, regardless of whether they are planning on becoming pregnant.^{2,3} However, it has been estimated that the average diet in the United States contains only about 200 to 250 mcg of naturally occurring folate from food.^{3,5} Only about 50% of this folate from food is absorbed by the body; cooking and storage can further deplete the absorbable amount.^{2,5}

In an effort to make up for this shortfall, the FDA has required that grains and cereals be fortified with folic acid—a synthetic form of folate—since 1998.² But despite this initiative, it is estimated that less than 10% of women of childbearing age have a red blood cell folate concentration greater than 906 nmol/L, the level associated with a significant reduction in risk of NTDs.⁶

Increasing folate awareness in women

Many women of childbearing age in the United States are still unaware of the importance of maintaining an adequate folate level.⁷ This has serious implications because approximately 3.1 million pregnancies each year—50% of all pregnancies in the United States—are unplanned.^{1,8}

START THE FOLATE CONVERSATION SOONER

Because daily folic acid supplementation should be initiated before conception to ensure the greatest benefit, it makes sense for healthcare professionals to introduce the idea of folate supplementation early to their patients and initiate a discussion on the topic with all women of childbearing age, even those who are not planning on becoming pregnant.

*Hypothetical daily intake

Models used for illustrative purposes only.

References: 1. Folic acid now. Centers for Disease Control and Prevention (CDC) Web site. www.cdc.gov/ncbddd/fact/folicfaqs.htm. Accessed October 2, 2009. 2. Folic acid. March of Dimes Web site. www.marchofdimes.com/printableArticles/19695_1151.asp. Accessed September 29, 2009. 3. Centers for Disease Control and Prevention. Recommendations for the use of folic acid to reduce the number of cases of spina bifida and other neural tube defects. *MMWR*. 1992;41(RR-14):1-6. www.cdc.gov/mmwr/preview/mmwrhtml/00019479.htm. Accessed September 30, 2009. 4. American Academy of Pediatrics Committee on Genetics. Folic acid for the prevention of neural tube defects. *Pediatrics*. 1999;104:325-327. 5. Standing Committee on the Scientific Evaluation of Dietary Reference Intakes, Food and Nutrition Board, Institute of Medicine. Folate. In: *Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline*. Washington, DC: National Academies Press; 1998. 6. Dietrich M, Brown CJP, Block G. The effect of folate fortification of cereal-grain products on blood folate status, dietary folate intake, and dietary folate sources among adult non-supplement users in the United States. *J Am Coll Nutr*. 2005;24:266-274. 7. Williams JL, Abelman SM, Fassett EM, et al. Health care provider knowledge and practices regarding folic acid, United States, 2002-2003. *Matern Child Health J*. 2006;10:S67-S72. 8. Finer LB, Henshaw SK. Disparities in rates of unintended pregnancy in the United States, 1994 and 2001. *Perspect Sex Reprod Health*. 2006;38:90-96.

Bayer HealthCare Pharmaceuticals and March of Dimes are working together to raise awareness about the importance of folate and folic acid. March of Dimes does not endorse specific products or brands.

March of Dimes®



Bayer HealthCare
Pharmaceuticals

BAYER and the Bayer Cross are registered trademarks of Bayer.

© 2010 Bayer HealthCare Pharmaceuticals Inc., Wayne, NJ 07470 All rights reserved. 170-10-0001-09 Printed in USA January 2010