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Critical Heart Defects Linked to Early-Onset Preeclampsia

— Pathology appears unique to singleton pregnancies

by Kay Jackson, Contributing Writer, MedPage Today

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Preeclampsia was significantly associated with noncritical heart defects in children overall, while onset before 34 weeks gestation was associated with critical heart defects too, a population-based study showed.

In infants born to women with preeclampsia, the overall prevalence of heart defects was higher than for those infants born to mothers without preeclampsia (16.7 versus 8.6 per 1,000), Nathalie Auger, MD, of Canada's University of Montreal Hospital Research Centre, and colleagues found.

Compared with infants of women with late-onset preeclampsia, those with early onset before 34 weeks gestation had 2.78-fold greater prevalence of critical heart defects (364.4 per 100,000) and 5.55-fold more noncritical heart defects (7,306.9 per 100,000).

However, the absolute risk of congenital heart defects was low, Auger and colleagues reported online in the Journal of the American Medical Association.

"This study provides novel evidence of a relationship between preeclampsia and congenital heart defects, powered by data for a large population of pregnant women," the investigators wrote.

prevalence," wrote the authors, adding, "Exclusion of multiple births from the data led to even stronger associations between early-onset preeclampsia and heart defects, suggesting that the pathology is unique to singleton pregnancies."

Although congenital heart defects are rare and the risk factors unclear, clinicians should keep this evidence in mind when managing pregnant women, especially those with preeclampsia with onset before 34 weeks gestation, Auger told MedPage Today.

"We recommend usual clinical care, with ultrasound screening during pregnancy for all women, and pulse oximetry of infants 24 hours after delivery," she said in an interview.

While there is no evidence to date that the risk of heart defects can be decreased prior to conception, some studies suggest that folic acid supplementation may be helpful, Auger pointed out.

In the study, data was compiled for more than 1.9 million mother-daughter pairs (17,296 neonates had heart defects), from hospital discharge abstracts entered in Quebec's province-wide database (1989-2012). Almost 25% of the population of Canada lives in Quebec, where 99% of women deliver in hospital, noted the investigators.

In Canada, diagnostic criteria for preeclampsia -- defined as hypertension and proteinuria developing after 20 weeks gestation in women who were previously normotensive -- include blood pressure (over 140 mm Hg systolic or 90 mm Hg diastolic) and proteinuria.

The analysis showed that the overall prevalence of heart defects was 8.9 per 1,000 infants.

Risk seen with preeclampsia in the mother was elevated for defects affecting all general structures of the heart, including the aorta, pulmonary artery, valves, ventricles, and septa. Early onset appeared to be the most important factor among the different variants of preeclampsia, said the investigators.

Of all specific heart defects, septal defects were the most prevalent.

Tetralogy of Fallot (41.2 versus 18.4)

Hypoplastic left heart (16.5 versus 12.0)

Coarctation of the aorta (33.0 versus 16.8)

Among noncritical defects, prevalence per 100,000 was higher for defects of the:

- Endocardial cushion (38.5 versus 13.4)
- Ventricular septum (405.3 versus 279.2)
- Atrial septum (755.5 versus 280.2)
- Valve (92.1 versus 33.1)
- Pulmonary artery (208.8 versus 72.5)

The prevalence of patent ductus arteriosus at term was also higher in infants of women with preeclampsia than in those without preeclampsia (224.0 versus 123.6 per 100,000), said the investigators. "All three site-specific defects, including aorta or pulmonary artery, valve, and septum, were more common in infants of women with preeclampsia than those without preeclampsia," they said.

Possible explanations for these findings include closer obstetric follow-up in women with preeclampsia, with increased ultrasonographic imaging to assess fetal growth, suggested Auger and colleagues. In addition, neonates of preeclamptic pregnancies have more morbidity and may be monitored more closely after birth.

"Opportunities to detect heart defects may therefore be more numerous compared with those for normotensive pregnancies," said the investigators.

More accurate investigation of the biologic pathways linking preeclampsia with congenital heart defects is the next step, Auger told MedPage Today. "Better

From the American Heart Association:

- Guidelines for the Prevention of Stroke in Women
- Cardiac Arrest In Pregnancy
- 2011 Guidelines for CVD Prevention in Women

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Reviewed by F. Perry Wilson, MD, MSCE
Assistant Professor, Section of Nephrology, Yale School of Medicine and Dorothy Caputo, MA, BSN, RN, Nurse Planner

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