

Public release date: 20-Nov-2010



Contact: Shari Leventhal

[sleventhal@asn-online.org](mailto:sleventhal@asn-online.org)

202-416-0658

[American Society of Nephrology](#)

# How mom's health may increase risk of kidney disease

## Weight loss and better control of diabetes might lower kids' risk of kidney disease

Children with Chronic Kidney Disease (CKD) are more likely to have mothers who were obese or had diabetes during pregnancy, according to a study presented at the American Society of Nephrology's 43rd Annual Meeting and Scientific Exposition, by Christine W. Hsu, MD (University of Washington, Seattle) and colleagues.

The study included more than 4,000 patients with childhood CKD—diagnosed at age 21 or younger—in Washington State. These patients were compared to more than 20,000 healthy children to evaluate possible relationships between a pregnant woman having diabetes, being obese or overweight, and the risk of her child developing CKD anytime during infancy, childhood, or adolescence.

The overall rate of childhood CKD was approximately 0.26 percent—about 1 case per 400 live births. When investigators adjusted for length of gestation, CKD risk was 69 percent higher for children whose mothers had diabetes before pregnancy. For children whose mothers developed diabetes during pregnancy (gestational diabetes), there was a 28 percent increase in CKD risk. Children of obese mothers demonstrated a 22 percent increase in CKD risk.

When specific causes of kidney disease were analyzed, children whose mothers had diabetes before pregnancy had nearly a 700 percent increase in the risk of kidney-related birth defects (renal aplasia/dysplasia). "Developmental abnormalities of the kidney and urinary tract are the most common cause of childhood CKD," Hsu explains.

The risk of urinary blockage (obstructive uropathy) —which can lead to CKD—was increased by 34 percent for children whose mothers had gestational diabetes, 23 percent in those whose mothers were obese, and 21 percent in those whose mothers were overweight but not obese.

In adults, CKD is often related to medical conditions like diabetes and high blood pressure. In contrast, according to Hsu, "Development of childhood CKD may be programmed prenatally." Few studies have looked at possible risk factors for CKD development before adulthood.

"Our research shows that childhood CKD is modestly associated with maternal diabetes and maternal overweight or obesity, with the strongest association between abnormal kidney development and maternal diabetes," says Hsu. "Previous studies have demonstrated that maternal diabetes is associated with an increased risk of general congenital abnormalities. However, with strict control of maternal diabetes, the rate of congenital malformations is similar to that of non-diabetic mothers."

The new results raise the possibility that stricter control of diabetes and weight control during pregnancy could decrease children's risk of developing CKD. "However, this would have to be evaluated in future research," says Hsu.

The study had some limitations related to the fact that it used Washington State birth records linked to a hospital discharge database. As a result, it could only identify children with CKD who were hospitalized and had kidney disease listed in their hospital discharge diagnoses. The study definition of CKD was also broad, and the results are being reanalyzed with a stricter CKD definition. Furthermore, conclusions regarding cause and effect are not possible due to the case control design of the study.

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Study co-authors include Kalani Yamamoto, MD, Rohan Henry, MD, Jordan Symons, MD, and Anneclaire De Roos, PhD (University of Washington).

Disclosures: The authors reported no financial disclosures.

"Prenatal Risk Factors for Childhood Chronic Kidney Disease," [SA-FC358] will be presented as an oral presentation on Saturday, November 20 at 5:45 PM MT in Room 405 of the Colorado Convention Center in Denver, CO.

ASN Renal Week 2010, the largest nephrology meeting of its kind, will provide a forum for 13,000 professionals to discuss the latest findings in renal research and engage in educational sessions related to advances in the care of patients with kidney and related disorders. Renal Week 2010 will take place November 16 – November 21 at the Colorado Convention Center in Denver, CO.

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