

# Diet Can Have an Impact on Gestational Diabetes

*Numerous studies show that high-fiber, low-fat regimens plus exercise are consistently beneficial.*

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CHICAGO — A diet high in fiber and low in fat reduces the risk of gestational diabetes appreciably, as does exercise, Michelle A. Williams, Sc.D., said at the annual scientific sessions of the American Diabetes Association.

The number of observational studies that have shown that diet and exercise can affect the risk of gestational diabetes has reached a critical mass that should be taken seriously, said Dr. Williams, professor of epidemiology at the University of Washington, Seattle.

There is an “impressive consistency” in the data, she said.

“This is a time for action, and we should be thinking about moving toward translational approaches from this research,” she said. “Pregnancy really is an ideal time for promoting healthful activities.”

A connection between a high-fat diet and gestational diabetes was first documented in an observational study in 1997 (*Diabetes Care* 1997;20:1647-50). Since then, two subsequent studies have confirmed that connection. One study did

not, but it involved women in China, where high-fat diets include polyunsaturated fat, she said.

In a United States prospective cohort study by researchers at the University of North Carolina at Chapel Hill, 1,698 pregnant women were asked about their diet. The investigators found that women who had gestational diabetes had a higher-fat diet than those who did not, with a mean percentage of 35% of their total calories from fat, compared with 33% for pregnant women without gestational diabetes (*Am. J. Clin. Nutr.* 2004;79:479-86). The researchers estimated that a woman with a fat intake of 40% of total calories had more than twice the risk of gestational diabetes than one whose fat intake was 20% of total calories. This was true even when the number of calories remained exactly the same. At the 40% fat level, more than 10% of women could be expected to have gestational diabetes.

In 2004, Dr. Williams’ group reported results of a survey suggesting that low vitamin C intake also resulted in increased risk of gestational diabetes. After interviewing 67 patients with gestational diabetes and 260 controls, they reported that

women who took fewer than 70 mg of vitamin C a day—an inadequate intake—had a 3.7 times higher risk of gestational diabetes than those who took more (*J. Reprod. Med.* 2004;49:257-66).

The group followed up that study by actually measuring plasma ascorbic acid in 755 women at an average 13 weeks’ gestation. That study showed that the women in the lowest quartile of plasma ascorbic acid had a rate of gestational diabetes of 9%, compared with a rate of 3% in women in the highest quartile (*Epidemiology* 2004;15:597-604).

Regarding fiber in the diet, a group that looked at Nurses’ Health Study data found that when the women had an intake of 22 gm or more of fiber per day prior to their pregnancy, their risk of gestational diabetes was reduced by 33% (*Diabetes Care* 2006;29:2223-30).

Dr. Williams said she found much the same reduction in risk in her own cohort of 288 cases of gestational diabetes and 444 controls. The data, which have not yet been published, shows that women in the highest quintile for fiber intake had a 40% reduction in risk of gestational diabetes, relative to women in the lowest quintile, and that the risk reduction followed a very linear trend down from the highest quintile. Less than half of the women, cases and controls alike, met the recommen-

dation that the daily diet should include five fruits and vegetables.

“Suffice it to say, if they were consuming five a day, their risk for gestational diabetes would [have been] reduced quite substantially,” she said.

Six observational studies have shown a benefit from exercise before and during pregnancy, Dr. Williams said. One found a risk reduction of 47% when women who were obese exercised during pregnancy (*Am. J. Epidemiol.* 1997;146:961-65).

Analysis of her own data on 155 cases and 386 controls showed a 55% reduction in risk of gestational diabetes in those women who reported that they engaged in regular leisure time physical activity prior to their pregnancy. Leisure time physical activity during pregnancy resulted in a 48% reduction in risk, she added.

Dr. Williams’ data also address the question of whether activity must be vigorous to produce a benefit, or whether it can be moderate, she said. Her analysis found that risk was reduced by 71% when that activity was vigorous, but risk was reduced by only 35% with moderate activity, such as walking.

In observational studies, it is probably impossible to control the analysis completely for variables that may confound the investigators’ conclusions, hard as the researchers may try, Dr. Williams noted. ■

## Screen Women Who Have Had GDM Early For Cardiovascular Disease, Type 2 Diabetes

CHICAGO — Data clearly show that women who develop gestational diabetes get cardiovascular disease at much earlier ages—often in their early-to-mid-40s—and should be targeted with preventive management, Dr. Darcy B. Carr said at the annual scientific sessions of the American Diabetes Association.

“Women with prior gestational diabetes should be screened earlier for cardiovascular risk factors, and we should take this opportunity to target them with more interventions aimed at reducing their risk,” said Dr. Carr, of the division of maternal-fetal medicine at the University of Washington, Seattle.

This increased early risk is largely—though perhaps not completely—due to the fact that women who develop gestational diabetes are at increased risk of type 2 diabetes, Dr. Carr said.

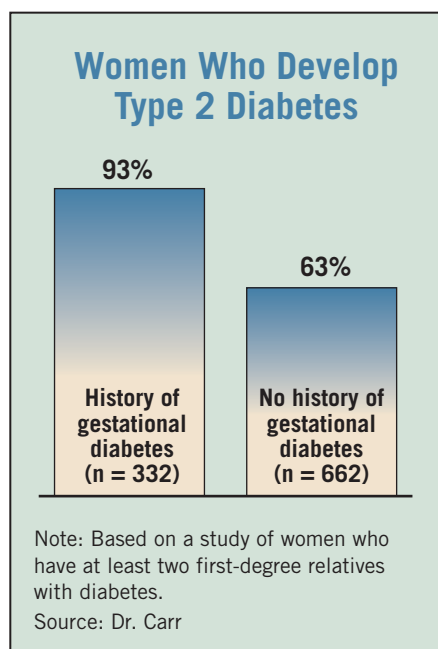
“I am sure there are women who do not develop diabetes who still have the cardiovascular risk,” she said.

Studies have shown that one-third to one-half of women with gestational diabetes will develop type 2 diabetes within 5 years, and that 70% will develop type 2 diabetes within 10 years.

Studies have also shown that individuals with gestational diabetes have a higher risk of metabolic syndrome, have more markers of vascular endothelial inflammation after their pregnancy, and also have a greater likelihood of hypertension.

The Nurses Health Study, in which more than 117,000 women were followed for 20 years, was able to demonstrate that the risk of cardiovascular disease (CVD) was tied to the development of type 2 diabetes.

But the study also found that CVD seemed to precede the type 2 diabetes, so that the risk of stroke and myocardial infarction was two to nearly four times higher in the women who had gestational diabetes even before they were diagnosed with type 2 diabetes, Dr. Carr said (*Diabetes Care* 2002;25:1129-34).



In a more recent study, Dr. Carr and colleagues looked at data from a study of women with at least two first-degree relatives with type 2 diabetes (*Diabetes Care* 2006;29:2078-83).

They found that of the 332 women in the study who reported having had gestational diabetes, 93% later developed type 2 diabetes.

That compared with 63% of the 662 patients who had given birth but who had not developed gestational diabetes. The women with gestational diabetes were also diagnosed with type 2 diabetes at a much younger age, a mean of 37 years versus a mean of 46 years.

The study revealed that the women with a history of gestational diabetes were not only more likely to develop coronary artery disease, 12% versus 11%, but also more likely to have a stroke, 6% versus 5%.

But the most important finding of the study was how young the women with a history of gestational diabetes were when they had these events, Dr. Carr said.

The mean age at which the women with gestational diabetes developed their coronary artery disease was 45 years, compared with 52 years for those without gestational diabetes, and the mean age of stroke was 50 years, versus 57 years.

“I think this study has significant implications for women with gestational diabetes,” Dr. Carr said. ■

## Maternal Diabetes Hikes Birth Defects But No Single Kind

CHICAGO — Pregnant women with diabetes have a two to four times higher risk of having a child with a birth defect, but a thorough review of a national birth defects registry does not show that any one type of defect is associated with diabetes, Dr. Adolfo Correa said at the annual scientific sessions of the American Diabetes Association.

The review looked at data from the National Birth Defects Prevention Study, which had reports on 9,778 cases of live births with birth defects and 4,086 control live births, said Dr. Correa, of the division of birth defects and developmental disabilities at the Centers for Disease Control and Prevention, Atlanta.

The analysis found a significantly increased risk of 25 out of 37 categories of defects looked at, with odds ratios of 5.0 or higher for 17 of those categories. However, no one category stood out.

The highest odds ratio was for sacral agenesis, but out of a total of 25 cases, the registry had only 9 babies born to mothers with diabetes. “Pregestational diabetes is associated with an increased risk for a wide variety of defects; the associations are moderate to strong,” he noted.

However, the study found that gestational diabetes had only weak associations with birth defects, and maternal obesity was not associated with birth defects, except when there was also gestational diabetes, he said. ■