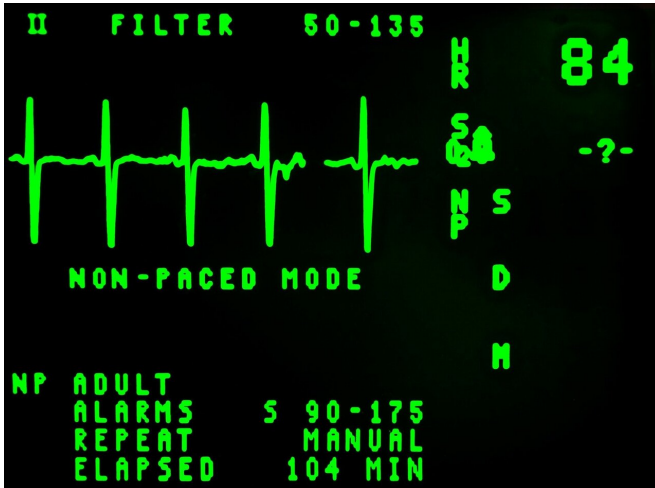


Diabetes during pregnancy may increase risk of heart disease

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Women with a history of diabetes during pregnancy (gestational diabetes) are twice as likely by mid-life to develop calcium in heart arteries—a strong predictor of heart disease—even if healthy blood sugar levels were attained many years after pregnancy, according to new research published today in the American Heart Association's flagship journal *Circulation*.

Gestational [diabetes](#), which is high blood [sugar](#) levels (glucose intolerance) first recognized during pregnancy, affects approximately 9% of U.S. pregnancies and up to 20% worldwide. After pregnancy, [women](#) who had [gestational diabetes](#) are at higher risk of developing prediabetes or Type 2 diabetes, conditions that are risk factors for cardiovascular disease.

Previous studies found a much higher risk of [heart](#) disease in women with a history of gestational diabetes who later developed Type 2 diabetes. However, it remained unclear whether heart disease risk among women with a history of

gestational diabetes was lower for women who attained healthy glucose levels or who developed prediabetes in mid-life.

In 2018, the American College of Cardiology/American Heart Association Cholesterol Clinical Practice Guidelines specified that a history of gestational diabetes enhances women's risk for artery build-up that leads to cardiovascular disease.

Using data from the multicenter, 30-year prospective Coronary Artery Risk Development in Young Adult (CARDIA) study, researchers investigated whether attaining healthy blood sugar levels after pregnancy would mitigate the increased risk of cardiovascular disease that is associated with a history of gestational diabetes.

"CARDIA is the first study to assess heart disease risk in women with a history of gestational diabetes compared to those without gestational diabetes according their blood sugar levels many years later. Women with previous gestational diabetes had a twofold higher risk of coronary artery calcium if they maintained normal blood sugar levels, later developed prediabetes, or later were diagnosed with Type 2 diabetes many years after pregnancy compared to women without previous gestational diabetes who had normal blood sugar levels," said Erica P. Gunderson, Ph.D., M.S., M.P.H., epidemiologist and senior research scientist in the Cardiovascular and Metabolic Conditions Section at Kaiser Permanente's Division of Research in Oakland, California.

The CARDIA study enrolled more than 5,100 U.S. men and women who were aged 18-30 years at the beginning of the study in 1985. The new analysis includes approximately 1,100 women (49% Black women and 51% white women) without Type 1 or Type 2 diabetes who subsequently gave birth at least once during the 25-year study period, which ended in 2011. Blood tests were performed from before to after pregnancies at five-year intervals to

determine if women had normal blood sugar levels, intermediate elevations in blood sugar levels (prediabetes) or they had developed overt Type 2 diabetes. Heart scans were performed to measure coronary artery calcium, a strong predictor for heart disease, at exams 15, 20 and 25 years after the baseline, the first exam of the study.

At the 25-year follow-up, the participants' median age was 48 years old, and 12% of the women in the study had a pregnancy complicated by gestational diabetes. The prospective analysis found:

- Women with a history of gestational diabetes had a two-fold higher risk of coronary artery calcification whether they had healthy blood sugar levels, prediabetes or Type 2 diabetes.
- Attaining healthy blood sugar levels after pregnancy did not decrease the risk of developing [cardiovascular disease](#) in mid-life for women with previous gestational diabetes.
- Of women with previous gestational diabetes, 36% developed prediabetes and 26% developed Type 2 diabetes, compared to 35% and 9% of women with no history of gestational diabetes.
- 25% of women with a history of gestational diabetes had some level of coronary artery calcium vs. 15% of women who never had gestational diabetes.

"We were surprised to discover that women with a history of gestational diabetes are at a significantly greater risk of heart artery calcification, even if they maintain normal blood sugar levels after pregnancy," Gunderson said.

"Our findings represent a shift in this paradigm by showing that normal [blood](#) glucose after gestational diabetes is still related to higher coronary artery calcium risk," the authors note.

"Risk assessment for heart disease should not wait until a woman has developed prediabetes or Type 2 diabetes," Gunderson said. "Diabetes and other [health problems](#) that develop during pregnancy serve as early harbingers of future chronic disease

risk, particularly heart disease. Health care systems need to integrate the individual's history of gestational diabetes into health records and monitor [risk factors](#) for heart disease, as well as the recommended testing for Type 2 diabetes in these women at regular intervals, which is critical to target prevention efforts."

Limitations of the study include that researchers had no measurement of coronary artery calcium levels prior to [pregnancy](#), and coronary artery calcium scores were used as a surrogate marker for heart [disease](#) risk not cardiovascular events.

More information: *Circulation* (2021). [DOI: 10.1161/CIRCULATIONAHA.120.047320](https://doi.org/10.1161/CIRCULATIONAHA.120.047320)

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