

Diabetes before or during pregnancy linked to early heart disease in children

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Children of mothers with diabetes have increased rates of early onset cardiovascular disease or CVD (conditions affecting the heart or blood vessels) from childhood up to the age of 40, finds a study from Denmark

published by *The BMJ* today.

The increased rates were more pronounced among children of mothers with a history of CVD or diabetic complications.

If this association is shown to be causal, preventing, screening, and treating [diabetes](#) in [women](#) of childbearing age could be important not only for improving the health of the women but also for reducing long term risks of CVD in their offspring, say the researchers.

The number of women diagnosed with diabetes before or during pregnancy has increased globally, and children of these women are more likely to have [risk factors](#) for future CVD, such as [high blood pressure](#) and high blood sugar levels.

It is unclear, however, whether or to what extent exposure to diabetes in the womb increases the risk of developing CVD in offspring over a lifetime.

So an international team of researchers set out to evaluate associations between diabetes diagnosed before or during pregnancy and early onset CVD in children during their first four decades of life.

They base their findings on national registry data for over 2.4 million children born without congenital heart disease in Denmark from 1977 to 2016.

Diabetes was categorised as pregestational (before pregnancy) or gestational (during pregnancy) and women with diabetic complications were identified.

Other potentially influential factors, such as mother's age, education, lifestyle and medical history were also taken into account.

During up to 40 years of follow-up, children of mothers with diabetes had a 29% increased overall rate of early onset CVD compared with children of mothers who did not have diabetes (cumulative risks: 17.8% vs 13.1%).

The researchers also found higher rates for specific types of CVD children of mothers with diabetes, particularly heart failure (45%), hypertensive disease (78%), deep vein thrombosis (82%), and pulmonary embolism (91%).

Increased rates were seen in each age group in childhood (before 20 years of age) and early adulthood (from 20 to 40 years of age), regardless of the type of diabetes they were exposed to (pregestational or gestational) and rates were similar for both type 1 and type 2 diabetes.

Children of mothers with diabetic complications or with diabetes and a history of CVD had the highest rates of early onset CVD than children of mothers with diabetes only.

This is an observational study, so can't establish cause and, despite adjusting for a wide range of variables, the authors cannot rule out the possibility that some of the results may have been due to unmeasured factors.

However, strengths include the large sample size, long follow-up of up to 40 years, and findings that remained similar after further analyses, suggesting that they are robust.

As such, they say "our study provides evidence that [children](#) of [mothers](#) with diabetes, especially those with a history of CVD or with diabetic complications, had increased rates of early onset CVD throughout the early decades of life."

These findings "highlight the importance of effective strategies for screening and preventing diabetes in [women of childbearing age](#)," they write.

And they call for future research to examine the degree of blood sugar (glycaemic) control during pregnancy that would minimise the risk of CVD in offspring throughout their life.

More information: Maternal diabetes during pregnancy and early onset of cardiovascular disease in offspring: population based cohort study with 40 years of follow-up, *The BMJ*, DOI: [10.1136/bmj.l6398](https://doi.org/10.1136/bmj.l6398) , www.bmj.com/content/367/bmj.l6398

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