Clinical reviews

Our panel of GPs review recent research papers in their specialist areas that may influence the way you practise

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Diabetes

Diabetes during pregnancy raises risk of early CVD in offspring

Diabetes of any type in pregnant women increases the risk of early onset cardiovascular disease (CVD) in their childen, a study from Denmark has found.

The researchers used data from Danish national registries to follow up a cohort of children from birth for up to 40 years. All liveborn children without congenital heart disease (the risk of which may also be increased by diabetes in pregnancy) born in Denmark between 1977 and 2016 were eligible for the study.

The study population of 2,432,000 children were followed up until a first diagnosis of CVD, death, emigration or 31 December 2016, whichever came first.

The primary outcome was a diagnosis of CVD in the offspring. Maternal diabetes was classified as gestational, or pregestational (type 1 or type 2).

The findings were adjusted for potential confounders including maternal age, parity, cohabitation status, smoking status, residence, educational achievement and maternal and paternal history of CVD before childbirth. However, the authors acknowledged that there were other possible confounding variables that were not adjusted for, for example alcohol use, diabetes control, folic acid supplementation, exercise and prenatal care.

Compared with mothers who did not have diabetes, mothers with the condition were more likely to be older, to have had higher education, higher parity, to live alone and were less likely to smoke.

Of the 2,432,000 eligible children, 54,864 (2.3%) were exposed to pregestational maternal diabetes; type 1 (0.9%), type 2 (0.3%) and gestational diabetes (1.1%). The proportion of mothers with diabetes increased across the period of the study.

During the follow-up period, 1,153 offspring of mothers with diabetes, and 91,311 offspring of mothers who did not have diabetes developed CVD. Those offspring whose mothers had diabetes had a higher rate of CVD than those whose mothers had not had the condition, hazard ratio (HR) 1.29 (95% CI: 1.21-1.37).

Both pregestational and gestational diabetes were associated with increased rates of CVD in the offspring:

- Pregestational diabetes
HR 1.34 (95% CI: 1.25-1.43)
- Pregestational diabetes (type 1)
HR 1.31 (95% CI: 1.20-1.43)
- Pregestational diabetes (type 2)
HR 1.39 (95% CI: 1.23-1.57)
- Gestational diabetes
HR 1.19 (95% CI: 1.07-1.32)

The subgroup analyses for the various types of CVD showed the following increased rates:

- Hypertension
HR 1.78 (95% CI: 1.50-2.11)
- Heart failure
HR 1.45 (95% CI: 0.89-2.35)
- Deep vein thrombosis
HR 1.82 (95% CI: 1.38-2.41)
- Pulmonary embolism
HR 1.91 (95% CI: 1.31-2.80)

The offspring of mothers with a history of CVD or diabetes complications were at greater increased risk of CVD:
HR 1.73 (95% CI: 1.36-2.20) and HR 1.60 (95% CI: 1.25-2.05) respectively.

The study authors conclude: '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.

'Future research should examine the degree of glycaemic control during pregnancy that would minimise the risk of CVD in offspring throughout their life.'

There are good theoretical reasons to suppose that excess glucose crossing the placental barrier could adversely affect the developing fetal vasculature. The authors point out that the cohort are still at an age when the risks of CVD remain relatively low, and that the effects already observed may become more pronounced over the next two decades.

The increasing rates of obesity that drive gestational and type 2 diabetes in mothers may make this an increasingly important risk factor for children born in the first half of the 21st century.

DR MATTHEW LOCKYER

Yongfu Y, Arah OA, Liew Z et al. Maternal diabetes during pregnancy and early onset of cardiovascular disease in offspring: population based cohort study with 40 years of follow-up. *BMJ* 2019;367:l6398

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