

# Pregnancy outcomes worsen for women with type 2 diabetes

Serious adverse pregnancy outcomes (congenital anomalies, stillbirths and neonatal deaths) occurred in 6.6% of women with type 2 diabetes in 2022, up from 4.9% in 2021, according to data just published in the National Pregnancy in Diabetes (NPID) Audit, while preparedness for pregnancy also decreased. In contrast, adverse pregnancy outcomes and preparedness for pregnancy improved year-on-year in women with type 1 diabetes. Overall, 1 in 2 babies born to mothers with pre-existing diabetes had complications related to maternal glucose, such as large birth weight, premature delivery (<37 weeks' gestation) and admission to neonatal care units. In 2022, there were more pregnancies in women with type 2 diabetes (nearly 3000) than in those with type 1 diabetes (2300). NICE recommends that preparedness for pregnancy should include use of reliable contraception until the target HbA<sub>1c</sub> of <48 mmol/mol is achieved, monthly HbA<sub>1c</sub> checks when trying to conceive, 5 mg folic acid daily, advice on weight loss if BMI is >27 kg/m<sup>2</sup>, and medication review with replacement of potentially harmful medications such as ACE inhibitors, ARBs, statins and glucose-lowering drugs other than metformin and insulin. Immediate referral to specialist antenatal care as soon as pregnancy is confirmed is also recommended. The NPID report recommends that Integrated Care Boards in England and Welsh Health Boards ensure that CGM and hybrid closed-loop pumps are accessible for appropriate women with type 1 diabetes; that providers of maternity diabetes care improve glucose-lowering to reduce the adverse trend of serious pregnancy outcomes; and that the HbA<sub>1c</sub> target of <48 mmol/mol at conception, prevention of unplanned pregnancy and preparedness for pregnancy remain imperative targets.



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The National Pregnancy in Diabetes (NPID) Audit explores the demographics, patterns of care and pregnancy outcomes in women with diabetes in England and Wales, comparing the care delivered against NICE Clinical Guidelines and Quality Standards, and makes recommendations to try to improve the quality of care before and during pregnancy. Planning/preparedness for pregnancy should include:

- Monthly HbA<sub>1c</sub> checks.
- Using reliable contraception until the target HbA<sub>1c</sub> of <48 mmol/mol is achieved.
- 5 mg folic acid daily.
- Advice on weight loss if BMI is >27 kg/m<sup>2</sup>.
- Medication review and switching of potentially

harmful medications, including ACE inhibitors, ARBs, statins and glucose-lowering medications apart from metformin and insulin.

As soon as pregnancy is confirmed, women should have immediate access to specialist antenatal care. In addition, women with type 1 diabetes should be offered real-time continuous glucose monitoring (CGM) to help achieve target pre-pregnancy glucose control, and to measure fasting and post-prandial glucose readings throughout pregnancy. By 2022, 95% of women with type 1 diabetes were using CGM. In England, women with type 2 diabetes using insulin who have had severe hypoglycaemia or unstable blood glucose should also be offered

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CGM in pregnancy, and in Wales all women on insulin should be offered CGM.

Babies of mothers with pre-existing diabetes are at risk of serious pregnancy complications, including congenital abnormalities, stillbirths and neonatal deaths, as well as more common complications such as large birth weight, premature delivery (<37 weeks), and admission to neonatal care units which can interrupt mother–baby bonding and feeding. The risk of serious adverse events is lowest in women who achieve an HbA<sub>1c</sub> <48 mmol/mol at conception and in the first 6 weeks of pregnancy, and data gathered from the audit in 2019 and 2020 demonstrated that the risk of all pregnancy complications was lower in women with HbA<sub>1c</sub> <43 mmol/mol after 24 weeks' gestation.

### Latest audit results

The newly published NPID report from the National Diabetes Audit presented data captured during 2021 and 2022 on 10 225 pregnancies in women with diabetes from England and Wales. In women with type 1 diabetes, there was an improvement in the rate of serious adverse events, from 5.9% in 2014–2020 to 5.1% in 2022; this was attributed to increased use of CGM prior to and during pregnancy. The rate of serious pregnancy outcomes was lower, at 4.4%, in those using CGM, compared to 6.2% in those not using the technology. CGM was also associated with fewer pre-term births (39.5% vs 44.0%) and slightly fewer admissions to neonatal care units. More than a quarter of women with type 1 diabetes now achieve the <48 mmol/mol target prior to conception and in early pregnancy, and more than 45% achieve the <43 mmol/mol target after 24 weeks.

There were 2975 pregnancies in women with early-onset type 2 diabetes in 2022, more pregnancies than in women with type 1 diabetes. Unfortunately, these women are older, have higher BMI and less intensive glucose-lowering treatment compared to those with type 1 diabetes, and 63% of them were in the two most deprived quintiles.

It is known that very small increases in maternal glucose after 24 weeks' gestation are associated with higher rates of perinatal death across the

range of HbA<sub>1c</sub> from 43–80 mmol/mol, but only 55% of women with type 2 diabetes achieved the recommended HbA<sub>1c</sub> of <43 mmol/mol, a proportion that has not changed since 2014. Rates of perinatal death continue to increase in babies of women with early-onset type 2 diabetes despite the knowledge that the risk can be improved by tighter glycaemic control.

Women with type 2 diabetes had higher rates of serious adverse pregnancy outcomes in 2022 than in previous years: 6.6% versus 4.9% in 2021. Women with type 2 diabetes had an average BMI of 33 kg/m<sup>2</sup> early in pregnancy, and NICE recommends that women preparing for pregnancy with a BMI over 27 kg/m<sup>2</sup> should be offered weight management programmes, which is therefore likely to represent a very large unmet need.

In 2021/2022, while there was improvement in women with type 1 diabetes being well-prepared for pregnancy (17.6% compared to 13.4% previously), in contrast, fewer women with type 2 diabetes were prepared for pregnancy than in previous years (9.5% compared to 11.0%), despite the fact that over 60% were receiving glucose-lowering therapy and thus, presumably, were in contact with healthcare professionals.

Supplementation with 5 mg folic acid has been steady in both those with type 1 diabetes and type 2 diabetes across the 9 years of the NPID audits (44% and 21%, respectively), and 3% versus 12% of women with type 1 diabetes and type 2 diabetes, respectively, were found to be taking potentially harmful medications.

Women with type 2 diabetes on average had their first specialist antenatal review 3 weeks later than women with type 1 diabetes: at 9 weeks instead of 6 weeks. In the most deprived two quintiles, only 18.6% of women with type 2 diabetes were well prepared for pregnancy, compared with 34.7% of women in the two least deprived quintiles. Ethnic disparities were also evident.

### Recommendations

Three recommendations were made to Integrated Care Boards in England and Welsh Health Boards:

- Help further improve pregnancy outcomes by ensuring that diabetes care providers enable all

women with type 1 diabetes of reproductive age to access diabetes technology (CGM and hybrid closed-loop systems) to help them achieve pregnancy glucose targets.

- Ensure providers of maternity diabetes care improve glucose-lowering using culturally appropriate dietary support, glucose monitoring and intensive insulin therapy to reduce the adverse trend of serious pregnancy outcomes in women with early-onset type 2 diabetes.
- Ensure that aiming for target glucose control (HbA<sub>1c</sub> <48 mmol/mol) prior to pregnancy remains an imperative in women with diabetes. Further ensure that women with diabetes have access to effective methods of contraception to prevent unplanned pregnancy. Those planning pregnancy should be offered monthly HbA<sub>1c</sub> checks, folic acid 5 mg supplementation, medication reviews, weight management programmes and rapid referral to specialist care when pregnancy is confirmed.

Practices in Scotland and Northern Ireland do not participate in the National Diabetes Audit programme, but there is no reason to believe that data from these countries will be significantly different than that shared in this audit. SIGN is in the final stages of preparing its *Diabetes in pregnancy* guideline, which is due to be published shortly. This will cover pre-pregnancy care and is anticipated to reflect the guidance offered here.

### How can we help?

We can all contribute to improvement in pregnancy outcomes in women with diabetes by discussing pregnancy intentions, and by facilitating effective contraception and understanding of need for pre-conception review. It is likely that primary care teams will be the only healthcare professionals involved in the care of women of child-bearing age with type 2 diabetes, so we need to take this responsibility seriously. This includes educating on the importance of planning pregnancies, warning against conception until HbA<sub>1c</sub> is <48 mmol/mol, offering referral to secondary care clinics if this is required to achieve tight glycaemic control and ensuring prompt specialist antenatal care when pregnancy is confirmed. Should we send these women information about pre-pregnancy planning and review, as well as discussing in every consultation? [Diabetes UK](#) and other organisations offer concise guidance which could help us make a real difference. ■

#### National Pregnancy in Diabetes Audit 2021 and 2022

The full report and data are available at NHS Digital. [Click here to access](#)

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