The National Pregnancy in Diabetes Audit: What does it tell us and what should we be doing?

Members of the audit team, Nick Lewis-Barned, Ruth Bell, Paula Curnow, Laura Fargher, Naomi Holman & Helen Murphy describe the findings

The publication of the first National Pregnancy in Diabetes Audit (NPID Audit) on 7 October this year represents a huge step forward in our attempts to make the outcomes for women with diabetes and their infants more closely approximate to the outcomes for those without diabetes. It is the first report from an ongoing annual national audit of diabetes in pregnancy that supports teams to know how they are getting on and allows the identification of national, regional and local priorities.

NPID background
The early stimulus for the NPID audit came from the Confidential Enquiry into Maternal and Child Health (CEMACH) Report of pregnancies for women with pregestational diabetes from 2002–2003. These showed poor levels of preparation for pregnancy, poor pregnancy outcomes and poor service organisation. Regional surveys in the North East and North West of England, and East Anglia showed us that measurement is possible and can drive improvements in care provision and pregnancy outcomes. At the same time, the National Service Framework for Diabetes (2002) set standards for women that were clearly not being met.

The CEMACH Report, published in 2007, was followed by National Institute for Health and Care Excellence (NICE) guidance for the management of diabetes in pregnancy in 2008, and the establishment by the National Clinical Director for Diabetes of a ‘task and finish’ group, whose remit was to develop and test a dataset to underpin quality improvement. This group reported in 2011 based on a retrospective analysis of the three regional surveys and a prospective proof of concept survey involving 13 further units and the West Midlands Diabetes in Pregnancy Network. The success of this led to the Healthcare Quality Improvement Partnership (HQIP), including the NPID Audit in the National Diabetes Audit (NDA) work programme in March 2012.

Key NPID Audit questions
The NPID Audit was carefully designed to answer three audit questions:
- Were women adequately prepared for pregnancy?
- Were adverse maternal outcomes minimised?
- Were adverse foetal/infant outcomes minimised?

The preliminary work resulted in a relatively concise dataset that provided information that directly answered the three questions above. In order to reduce the local burden of data.
collection, plans were made to obtain as much data as possible through linking to established national datasets, such as the core National Diabetes Audit, Hospital Episode Statistics and Patient Episode Database for Wales.

**How does the Audit work?**

The NPID Audit is managed by the Health and Social Care Information Centre (HSCIC) in partnership with Diabetes UK and supported by Public Health England (PHE). An advisory group consists of representatives of antenatal diabetes teams (obstetricians, physicians, specialist midwives), as well as women with diabetes, Diabetes UK, the HSCIC and Public Health England.

The NPID Audit is part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP). This means that it is not only open to any unit providing obstetric care for women with pregestational diabetes in England, Wales and the Isle of Man that wishes to take part, but is also an audit that acute trusts are mandated to take part in if they provide antenatal diabetes services. All acute trusts have been invited to participate. It is also closely linked to Regional networks where these do not already exist. In the North East of England the presence of the existing network and survey was enhanced by aligning the dataset to the NPID Audit and contributing aggregated de-identified data to the national audit.

In the first annual cycle of NPID, units were encouraged to include all women whose pregnancies ended between 1 January 2013 and 31 December 2013 and had their first contact with their joint antenatal service on or after 1 July 2012.

**Who took part?**

A total of 128 different organisations took part in the NPID audit. Units started collecting data at different stages through 2012–2013, and potentially not all women gave consent so not all women who were eligible were necessarily included. However 1,697 women had data submitted representing 1,704 pregnancies (around 0.4 per cent of all pregnancies in participating units).

**Findings**

Women with diabetes are more likely to have adverse outcomes, including foetal anomaly, stillbirth, macrosomia and neonatal death. Foetal anomaly and stillbirth are related to the quality of glucose control in early pregnancy and it is therefore recommended that all women with diabetes optimise glucose control and start folic acid prior to becoming pregnant. In addition, some drug treatments used in diabetes may cause foetal harm and should be avoided when planning a pregnancy.

Evidence for preparation for pregnancy was based on three audit markers:

- being on folic acid prior to the last menstrual period
- having blood glucose control that was either at the level of the NICE recommended target in the first trimester (less than 43mmol/mol) or below a pragmatic target of less than 53mmol/mol
- not taking medications that may cause harm, in particular statin treatment, ACE inhibitors (ACE-I), Angiotensin blocking agent (ARB) or oral hypoglycaemic agents other than metformin.

Only a minority of women were taking folic acid, and even fewer at the recommended 5mg dose, achievement of glucose targets was poor, and a significant proportion of women were taking potentially harmful medications. Women with Type 1 diabetes were more likely to be taking folic acid than women with Type 2 diabetes and more likely to be taking the higher 5mg dose. They were also less likely to be on medications that might cause harm.

In contrast, women with Type 2 diabetes were more likely to have lower HbA1c levels. This suggests that they had less actively prepared for pregnancy in terms of thinking through medications to take and avoid, but were achieving better glucose control.

Despite this, only 20.7 per cent of women were adequately prepared for pregnancy using the combined criteria of taking folic acid and first trimester HbA1c less than 53mmol/mol. This was disappointing and suggests that improvements have been, at best, modest since the CEMACH report. It is also clear that the changing demographic of women with diabetes who become pregnant poses significant new challenges to healthcare professionals engaging and supporting women with pregnancy preparation.

**Figure 2 Diabetes type**

[Diagram showing the distribution of diabetes type among pregnant women.]

Type 1 Diabetes: 44.9%
Type 2 Diabetes: 54.4%
Other: 0.7%
Pregnancy outcomes

Significant numbers of infants were large for gestational age, and this was clearly related to higher HbA1c levels in later pregnancy. For women with Type 1 diabetes just under half (46.0 per cent) were above the 90th centile for gestational stage, and over a quarter (26 per cent) above the 97th centile. The figures for women with Type 2 diabetes were 23.4 per cent and 12.5 per cent, respectively. This represents both a huge challenge and also a potential opportunity to improve rates of macrosomia.

The proportion of pregnancies resulting in a major adverse pregnancy outcome was high (Figure 1). Nearly five per cent of pregnancies resulted in an anomaly and five per cent in miscarriage. The rates of stillbirth and neonatal death were still two to four times the background rates in England and Wales. These rates are not significantly different from the rates reported in the CEMACH survey. Foetal anomaly was more likely in women whose early pregnancy HbA1c was higher, and higher HbA1c after 24 weeks was significantly associated with normally formed stillbirth and with neonatal death.

On a more positive note, fewer infants were admitted to neonatal special care or intensive care and 70.3 per cent were cared for on a postnatal ward with their mothers. This is an improvement on the 42.8 per cent observed by CEMACH.

Increase in Type 2

Although just over half of women (54.4 per cent) had Type 1 diabetes, there was a striking increase in the proportion with Type 2 diabetes (44.9 per cent) compared with the findings of the CEMACH report just 10 years earlier (Type 2 diabetes 27.3 per cent) (Figure 2). Women with Type 2 diabetes were, on average, older, more overweight, more likely to come from Black and ethnic minority backgrounds, and to live in more deprived areas.

Next steps

The first cycle of NPID has been a huge achievement that reflects the commitment and enthusiasm of large numbers of antenatal diabetes teams. It has been able to deliver useful information about diabetes and pregnancy in England, Wales and the Isle of Man, and provides a strong baseline for future annual audit.

The results show that there has been little or no progress in the preparation that women with pregestational diabetes make for pregnancy over the last 10 years and little change in the outcomes. The changing demographics highlighted in the audit also present new challenges for pregnancy support for women who are older, have had diabetes for a relatively short time and are more often from socially deprived and ethnic minority groups.

The audit calls for a renewed commitment from every antenatal diabetes service to:

● participate in the NPID Audit
● develop local improvement initiatives to reduce pregnancy risk.

Specifically, units should:

● urgently develop a strategic focus on improving preparation for pregnancy, including engaging with primary care teams locally to raise awareness and enhance pregnancy planning
● develop plans to incorporate training about pregnancy into patient education programmes, especially for women with Type 2 diabetes
● focus on improving glycaemic control during pregnancy for women with both Type 1 and Type 2 diabetes to avoid late adverse foetal outcomes.

Responding to this challenge will require coordinated and systematic multisector approaches with commissioners, primary care teams, specialist and community services (including sexual health and family planning) working together. Imaginative programmes with communities at high risk that are more difficult to engage, and making use of health promotion and health prevention strategies are likely to be needed if we are to see improved outcomes.

Acknowledgements:

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REFERENCES

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