

Latest findings from the National Pregnancy in Diabetes audit report

Are women with diabetes adequately prepared for pregnancy, are steps taken during pregnancy to minimise adverse maternal outcomes, and are adverse fetal and neonatal outcomes also minimised? These questions are addressed in the latest National Pregnancy in Diabetes audit published in October 2017. Steve Chaplin here examines the latest audit results.

The National Diabetes Audit has, over the years, produced some challenging reports about the quality of NHS diabetes care. One of its strengths is the honesty with which it describes the data, whether it is a failure to achieve targets in care delivery or a high frequency of medication errors among inpatients.

So when the latest report from the National Pregnancy in Diabetes (NPID) audit¹ begins with the quote *'It's time for diabetes and maternity networks to work together and get a grip on finding solutions to improve obstetric and neonatal outcomes of women with diabetes'* from Helen Murphy, Professor of Medicine (Diabetes and Antenatal Care), University of East Anglia, and Professor Women's Health, King's College London, it is evident we can expect some sobering statistics.

It is not the only quote; another two are less direct but still pointed, noting: *'There is a lot more that could be done to encourage women to get pregnancy ready and to help with a happy and healthy pregnancy'* (patient representative), and *'The NPID audit continues to demonstrate excellent collaboration between professional and patient groups to provide important but concerning information about mothers and babies...'* (Dr Jane Hawdon, Consultant Neonatologist, Royal Free London NHS Foundation Trust).

How the audit is conducted

The NPID audit evaluates the quality of antenatal care and pregnancy outcomes for women with pregestational diabetes. It is part of the National Clinical Audit and Patient Outcomes Programme, which is

Prior to pregnancy

- Use of folic acid supplement
- Keeping HbA_{1c} below 48mmol/mol (6.5%) where achievable without causing problematic hypoglycaemia
- Stopping or substituting oral glucose-lowering drugs other than metformin
- Suspending statins and ACE inhibitors/angiotensin receptor blockers

During pregnancy

- Early first contact with joint diabetes and antenatal clinic
- Monitoring HbA_{1c} to assess level of risk to pregnancy
- More frequent retinal screening

Birth and neonatal care

- Elective birth and timing of birth
- Transfer of infants to intensive, high-dependency or special care only if there are clear clinical indications

Box 1. NICE recommendations for managing diabetes in pregnancy used by the National Pregnancy in Diabetes audit²

commissioned by the Healthcare Quality Improvement Partnership (led by the Academy of Medical Royal Colleges, the Royal College of Nursing, and National Voices) and funded by NHS England.

The audit addressed three questions:

- Were women with diabetes adequately prepared for pregnancy?
- Were appropriate steps taken during pregnancy to minimise adverse outcomes to the mother?
- Were adverse fetal and neonatal outcomes minimised?

The quality of care was assessed against the recommendations made by NICE in its 2015 guideline 'Diabetes in pregnancy: management from pre-conception to the post-natal period'.² (Box 1.)

Overview

The latest audit included data from 2016 provided by 172 services in England, Wales and the Isle of Man (with foci in London, the North West and the North East) for 3297 women and 3304 pregnancies. Since 2014, the reference year for some comparisons in the report, an additional 22 services contributed data. About half of women had type 1 diabetes (T1D) and about half had

type 2 diabetes (T2D), with a small number having 'other' diabetes.

There was large variation between the regions in the proportion of women with T1D or T2D, ranging from 27% in London to 60% in Wales for T2D and, for T1D, 39% in the South West and 71% in London. Since 2014, the overall proportion of women with T2D in the audit rose from 44% to 50%. They tended to be slightly older (median 34 vs 30 years), had a higher median BMI (32.6 vs 26.1kg/m²) and a shorter median duration of diabetes (4.0 vs 14 years) than women with T1D. White women made up 78% of women with T1D but only 40% of those with T2D. Two-thirds of women with T2D were in the lowest two quintiles for social deprivation.

Were women adequately prepared for pregnancy?

There was no significant change between 2014 and 2016 in the proportions of pregnancies for which NICE guideline targets were met. Only 15% of women with T1D and 38% of those with T2D had first trimester HbA_{1c} <48mmol/mol whereas 13% and 7.4% respectively had HbA_{1c} >86mmol/mol. There were no differences in age, duration

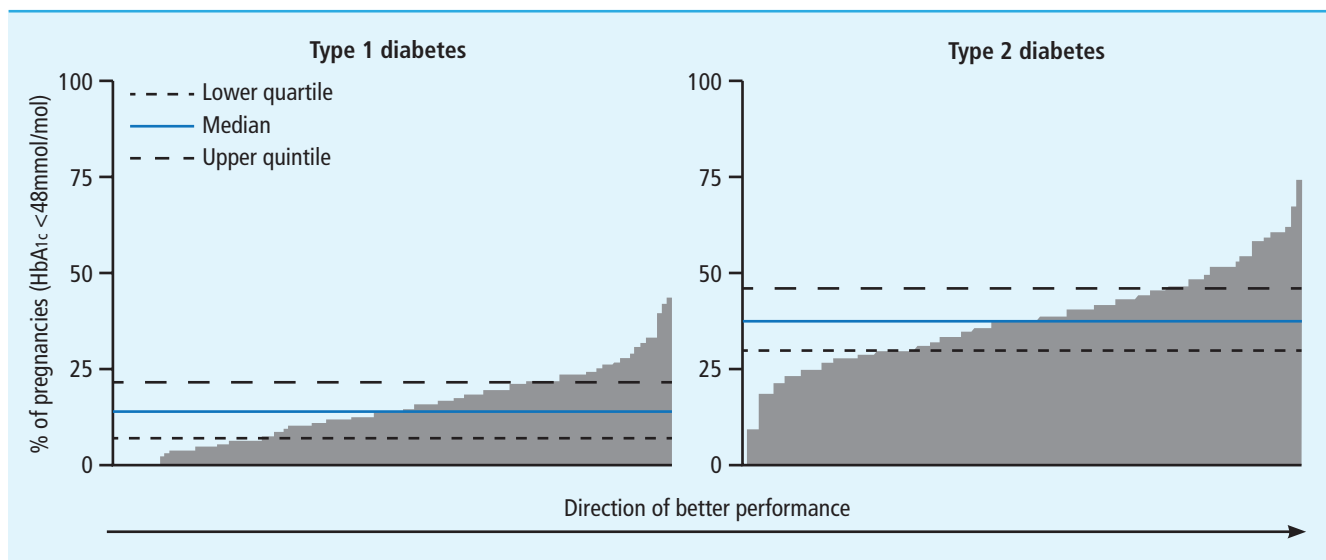


Figure 1. Variation between services in first trimester HbA_{1c} <48mmol/mol, 2014–2016. (Copyright © 2017 Health and Social Care Information Centre)¹

of diabetes or BMI among women with T2D with HbA_{1c} above or below 48mmol/mol; by contrast, women with T1D and HbA_{1c} <48mmol/mol were older and had been diagnosed more recently than those with worse glycaemic control. Figure 1 shows the huge variation between services in achieving target HbA_{1c} in the first trimester in the three years to 2016.

Uptake of folic acid was no higher than in 2014. Overall, 48% of women with T1D and 32% of those with T2D were prescribed folic acid but 6% and 9% respectively were not taking the recommended dose of 5mg/day. Again, there was marked variation in folic acid use and in 75% of services only a third of women with T2D had taken 5mg folic acid prior to pregnancy. Folic acid use also declined with worsening socioeconomic deprivation, confirming that women in the most deprived groups were least well prepared for pregnancy.

Among women with T1D, 93% were using insulin alone and 5% combined it with metformin. About one-fifth used an insulin pump and they were more likely to achieve HbA_{1c} <48mmol/mol than non-users (20% vs 13%). About 2% were taking at least one contraindicated medicine (see Box 1) but this, the NPID audit states, is a significant improvement over 2014 when it was 3%. Half of women with T2D were using metformin monotherapy, 12% also used insulin and 8% used insulin alone; 13% were taking a

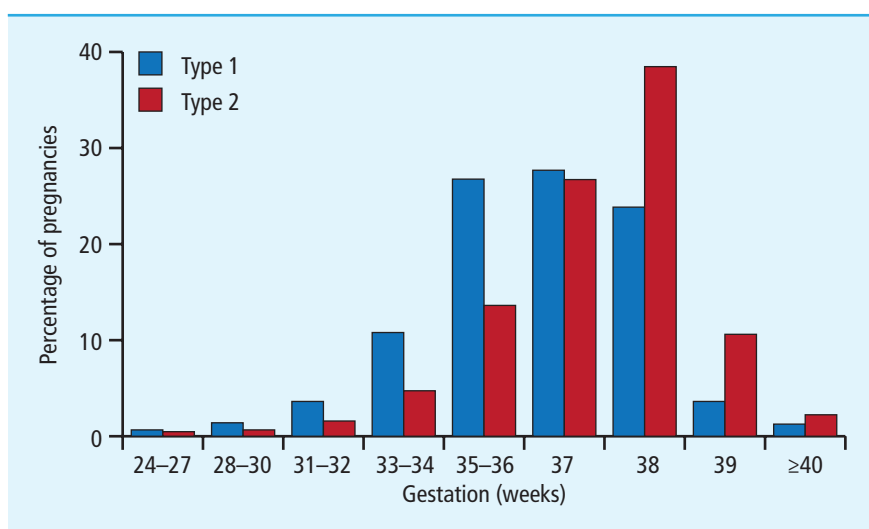


Figure 2. Gestation at delivery for singleton live births, 2016. (Copyright © 2017 Health and Social Care Information Centre)¹

contraindicated medicine and this was not significantly different from 2014 (15%).

Using these criteria for first trimester HbA_{1c} and medication use, only one in 12 women could be described as being well prepared for pregnancy, with no difference between T1D and T2D and no improvement over 2014.

Were steps taken during pregnancy to minimise adverse outcomes to the mother?

In another sign that fewer women with T2D are informed or prepared, 40% did not meet with the joint diabetes antenatal team before 10⁺ weeks gestation compared with about a quarter of women with T1D.

This was a significant difference that did not change between 2014 and 2016. Of course, this does not preclude any medical contact about pregnancy by that time, but NICE recommends early involvement of the diabetes team. Once again, there was huge variation in performance across the country, ranging from as few as 10% of women with T2D and 25% of those with T1D to 100% having a timely appointment.

By 24 weeks, HbA_{1c} was <48mmol/mol in 41% of women with T1D and 75% with T2D, with medians of 50 and 412 respectively (but 10th to 90th centile ranges of 38–65 and 33–57mmol/mol). There was a trend for the proportion of women with HbA_{1c} below the target

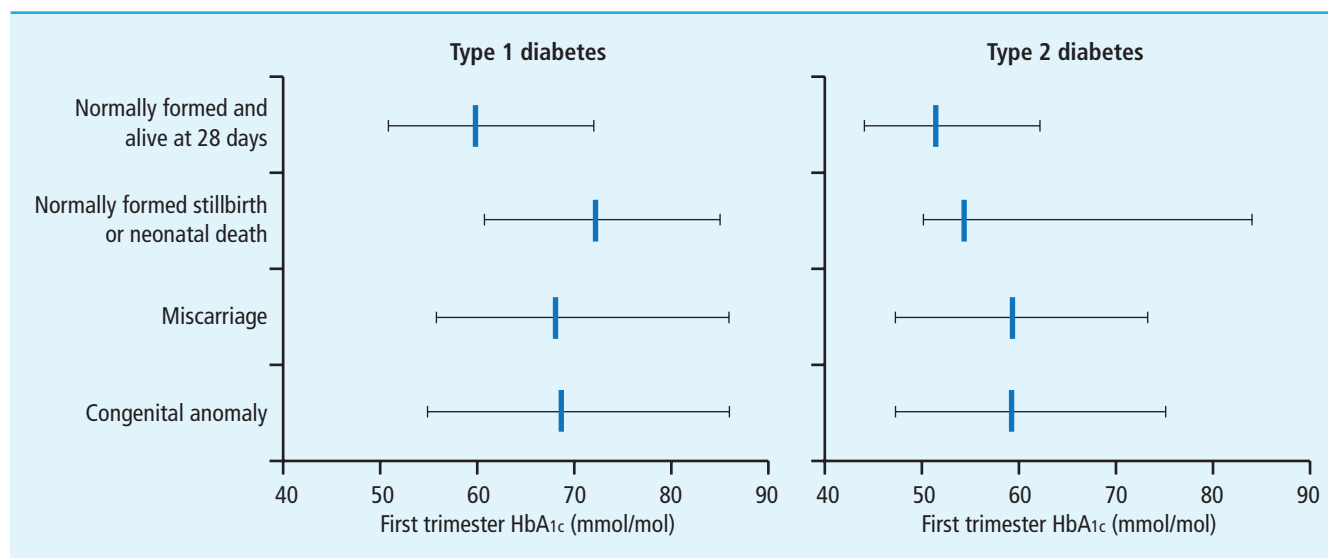


Figure 3. Median values and interquartile ranges for first trimester HbA_{1c} for selected pregnancy outcomes, 2016. (Copyright © 2017 Health and Social Care Information Centre)¹

threshold to decrease with worsening deprivation, but the difference between the highest and lowest quintiles was significant only for those with T1D. Variation between services was once again strikingly large, with extremes of 0–82% of women with T1D and 43–100% with T2D achieving HbA_{1c} <48mmol/mol in the third trimester.

Maternal complications were more frequent among women with T1D. In 2015 (the latest year for which hospital episode statistics were available), the proportion of women with at least one admission with hypoglycaemia during pregnancy was 9.7% for T1D and 3.2% for T2D; the corresponding figures for diabetic ketoacidosis were 2.7% and 0.3%. This was no different from 2014.

More than half of births occurred between 37⁺⁰ and 38⁺⁶ weeks, with a trend to earlier birth for women with T1D (Figure 2). Forty-three percent of women with T1D and 21% with T2D delivered before this period, and about 5% and 12% respectively delivered later. The NPID report notes that the high proportion of earlier births suggests there were concerns about the fetus and/or the mother. Late deliveries were less frequent than in 2014 (6%) among women with T1D. Differences between services were again large, with ranges of <10% to >80% of women with T1D and 0% to 48% with T2D giving birth before 37 weeks.

In 2015, only a minority of women had a spontaneous delivery (T1D 19%; T2D 35%). Caesarean section was the most frequent mode of delivery, evenly divided between elective (32%, 29%) and emergency (32%, 28%) procedures. Instrumental delivery was also more frequent for women with T1D (14% vs 7.5%). Significantly more women with T1D whose labour was induced before 37⁺⁶ weeks subsequently delivered by Caesarean section (47% vs 36% with T2D) but there was no difference when induction took place later. These rates were similar to those reported in 2014.

Were adverse fetal and neonatal outcomes minimised?

One percent of registered births to mothers with diabetes in 2016 were stillbirths, with similar proportions for T1D and T2D. This was a higher rate than in the general population (10.2 vs 4.3 per 1000 live and stillbirths). Neonatal deaths were also more frequent than in the UK as a whole in 2015 (10.0 vs 2.7 per 1000 births). These figures were no different from 2014. The combined rate of live births and terminations at any gestational age, stillbirths and miscarriages after 20 weeks was 48 per 1000 for T1D and 45 per 1000 for T2D; comparisons with other reported figures must be interpreted with care due to differences in data collection.

First trimester HbA_{1c} was a marker for adverse outcomes. It

was significantly higher among women with T1D or T2D where pregnancy ended in a miscarriage or there was a congenital anomaly (Figure 3). Among women with T1D, high HbA_{1c} was also associated with a higher rate of stillbirth or neonatal death.

The proportions of babies born large for gestational age (>90th centile) was 48% for women with T1D and 23% for those with T2D. Macrosomia (birth weight >4kg) was more common in babies born to women with T1D (18%) but not T2D (11%) compared with 2015 data for England and Wales as a whole (11%). These figures were similar to those of 2014. Local variation in the proportion of babies large for gestational age was marked: 10–70% for T1D and 0–47% for T2D.

Rates of neonatal admission were higher than in the general maternity population. Most babies born at <34 weeks were admitted to a neonatal unit; the admission rate was higher among babies born after 37⁺⁰ weeks for women with T1D than those with T2D. Again, there was no change since 2014 and more evidence of differences in performance between services, with admission rates ranging from 0–67% for T1D and 0–43% for T2D.

Third trimester HbA_{1c} levels ≥48mmol/mol was associated with higher rates of preterm births, large for gestational age and neonatal care admissions compared with

lower HbA_{1c}. Rates were higher for babies born to women with T1D than those with T2D for preterm birth (approximately 50% vs 35%) and large for gestational age (approximately 58% vs 42%) but similar for neonatal admissions (approximately 27% vs 26%).

Comment

The NPID audit report concludes: *'There is a concerning lack of progress with delivering the NICE recommendations over the last 3 years.'* The need is now urgent for services to 'own' these outcomes – by which it appears to mean stop denying there's nothing wrong – and use the NPID data to identify where every aspect of care can be improved.

Few women were well prepared for pregnancy, almost half of babies had complications associated with maternal diabetes, and adverse outcomes were more frequent than in the general population.

The contrasts in performance between services is nothing short of shocking: though the statistics have not been adjusted for geographical deprivation and ethnic mix, diabetes services should be tailored to address those factors and meet the needs of local populations. Clearly, that is often not the case but, in an era of repeated funding crises and now an impending shortage of nurses and other health professionals, change seems ever more difficult.

The NPID recommends actions for everyone in primary and secondary care and community services, but leadership must come from joint diabetes and maternity services. They alone, the NPID says, have sufficient focus on pregnancy in diabetes to lead change, reduce social and cultural barriers to pregnancy preparation and provide improved support.

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1. NHS Digital. National Pregnancy in Diabetes Audit Report, 2016. England, Wales and the Isle of Man. October 2017.
2. NICE. Diabetes in pregnancy: management from preconception to the postnatal period. NICE guideline [NG3]. NICE: February 2015.