Analysing newly-published diabetes audits: are care standards being achieved?

Data from recent diabetes audits have shed new light on standards of care. Steve Chaplin reports.

Diabetes is, like the national waistline, an expanding problem. Recorded prevalence increased from 2–3% in 1994 to 5–7% in 2014. It now accounts for 10% of primary care prescribing costs in England. In 2011, it was estimated that UK health care spending on diabetes could rise from around £10 billion to £17 billion in 2035/2036, largely due to the increasing number of older people and rising levels of overweight and obesity. Eighty percent of spending is on the management of complications so our current strategy of investing in interventions that reduce risk factors will reap dividends. But recent analyses from the National Diabetes Audit show that NHS performance needs to improve.

National Pregnancy in Diabetes Audit

The quality of diabetes care during pregnancy has been a concern since 2002/03, when the Confidential Enquiry into Maternal and Child Health (CEMACH) revealed ‘severe deficiencies’ in the quality of care before and during pregnancy, and poor outcomes compared with other countries. The 2001 National Service Framework for Diabetes set quality standards for diabetes services; these were supplemented in 2008 by a NICE clinical guideline – this was updated in 2015. With standards in place, it became possible to audit the quality of care and, as part of the National Diabetes Audit programme, the National Pregnancy in Diabetes Audit began collecting data in 2013, and published its first annual report in 2014/15.

The second report, covering clinical activity in 2014, included data from 150 units in England and Wales (up from 128 in 2013), representing 137 of the 157 consultant-led units. Type of diabetes was known for 90% of the 2537 women involved (1697 in 2013): 52% had type 1 (T1DM) and 47% had type 2 (T2DM). Women with T2DM were older, had higher BMI, were more likely to be of Asian or black ethnic origin, and were more likely to live in areas of higher deprivation.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Type 1 diabetes</th>
<th>Type 2 diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age at end of pregnancy (years)</td>
<td>31.8</td>
<td>34.0</td>
</tr>
<tr>
<td>Mean age at diagnosis (years)</td>
<td>17.7</td>
<td>29.4</td>
</tr>
<tr>
<td>Mean body mass index (kg/m²)</td>
<td>26.0</td>
<td>32.5</td>
</tr>
</tbody>
</table>

Figure 1. National Pregnancy in Diabetes Audit. Percentage of pregnancies with first trimester HbA₁c <48mmol/mol by: (A) ethnicity, and (B) deprivation score of area of residence. (Copyright © 2015, Healthcare Quality Improvement Partnership, National Diabetes Audit)

WERE WOMEN ADEQUATELY PREPARED FOR PREGNANCY?

The audit reveals significant shortcomings in drug treatment and the quality of glycaemic control for many women with diabetes. NICE recommends that women with diabetes...
should take folic acid 5mg/day when planning pregnancy until 12 weeks' gestation. This standard was met by 45% of women with T1DM and 24% with T2DM. A further 8% and 10% respectively were taking the 400μg dose recommended for women without diabetes. Folic acid intake was not recorded for 11% of women.

Only 75% of women had an HbA1c measurement recorded for the first trimester. In 2014/15, the target for women planning pregnancy was 43mmol/mol (6.1%). This was achieved by only 8% of women with T1DM and 22% of those with T2DM. In 2015, NICE updated this target to 48mmol/mol (6.5%) – a small increase that made a big difference, with 15% and 36% of women respectively now meeting the target. Overall, 52% of pregnancies had a recorded first trimester HbA1c of 58mmol/mol (7.5%). Pregnancy should be avoided when HbA1c exceeds 86mmol/mol (10%); this level was exceeded by 12% of women with T1DM and by 8% of those with T2DM. Target HbA1c was achieved in fewer women of Asian or black ethnic origin, and in those living in areas of greatest deprivation (Table 1, Figure 1). Glycaemic control generally improved during pregnancy but this is a physiological phenomenon and it is not clear to what extent better drug treatment contributed to this.

Oral glucose-lowering drugs other than metformin should be discontinued before pregnancy and insulin should be substituted. Among women with T2DM, 51% were taking only metformin at the time of their last menstrual period, 10% were taking insulin and 14% were taking insulin and metformin; 70% of all women used a basal-bolus insulin regimen.

Statins, ACE inhibitors and angiotensin receptor blockers (ARBs) should be discontinued before pregnancy. In 2014, 13% of women with T1DM and 57% of those with T2DM were taking an ACEI or ARB when they became pregnant, and 2.1% and 7.1% respectively were taking a statin. There is a lack of audit data on hypoglycaemia incidence during pregnancy so the report utilises hospital episode statistics as a surrogate measure; these figures include episodes where hypoglycaemia was recorded as the primary or other diagnosis but do not include events treated without an admission. For pregnancies ending in 2013, 9.3% of women with T1DM and 2.7% with T2DM had at least one such hospital episode; this was significantly greater than among non-pregnant women with diabetes (2.1% and 0.4% respectively for 20–39 year-olds).

Weren adverse fetal/infant outcomes minimised?
The number of pregnancies with adverse outcomes was low, therefore the analysis pools data from 2013 and 2014. In 2013, it was recommended that pregnant women with diabetes who have a normally grown fetus should be offered elective birth through induction, or elective caesarean section if indicated, after 38 weeks. Just over half of deliveries after 37 weeks were induced and 67% of women with T1DM and 52% of those with T2DM had a caesarean. Thirty percent of deliveries were emergency caesareans, down from 38% in the CEMACH survey.

The proportion of live births among diabetic women was 98.9% (vs 99.5% in the population as a whole). Rates of stillbirth (12.8 per 1000 births) and neonatal death (7.6 per 1000) seem higher than for the population as a whole (4.7 and 2.6 per 1000 respectively) but the data are not comparable due to differences in methodology and demography. Similarly, the rate of all congenital anomalies was 44.2 per 1000 for women with diabetes and 22.7 per 1000 for the general population, but differences in recording methods make comparisons difficult. Compared with women with normal live births, HbA1c was higher in the first and third trimesters for pregnancies ending in preterm delivery, miscarriage, stillbirth, neonatal death or when the infant had a congenital anomaly. Adverse pregnancy outcome was statistically associated with poor glycaemic control and deprivation, but these factors did not adequately explain the excess.

The incidence of macrosomia (birth weight >4000g) was 18% for women with T1DM and 11% for those with T2DM; 46% of babies were ≥90th centile for women with T1DM compared with 23% born to women with T2DM. Women with HbA1c ≥48mmol/mol (6.5%) after the 24th week were more likely to have an infant large for gestational age.

More babies born to women with T2DM received normal postnatal care (75% vs 58% of mothers with T1DM). Overall, 81% of babies born at 37 weeks or later received normal postnatal care compared with 55% recorded in the CEMACH survey; 16% of babies delivered at 37 weeks or later in 2013 were admitted to special care compared with 33% in 2002–03.

Conclusion
It is not surprising that outcomes overall have not greatly improved in the past decade. Women with diabetes were not well prepared for pregnancy, many having poor glycaemic control.
control, some not accessing appropriate care and a small number continuing to take potentially harmful medication. The quality of care for the most deprived communities and for women of black and Asian origin continues to lag behind other groups. This poses a challenge to policy makers, commissioners, clinical commissioning groups (CCGs), local health boards (LHBs), acute trusts, and clinical teams.

**National Diabetes Audit 2013/14 and 2014/15**

According to the Health and Social Care Information Centre, the National Diabetes Audit is the largest annual clinical audit in the world and the most comprehensive of its kind. As such, it probably attracts attention from scientists all over the world, keen to see how the NHS in England and Wales delivers the high quality services recommended by NICE. The answer is, as it has been for some time, not very well.

**Participation**

The latest audit data on care processes and treatment targets come from 2013/14 and 2014/15. There are signs of improvement in some areas but the overall shortfall in performance remains substantial. Worryingly, participation in the audit by GP practices has dropped from nearly 71% in 2012/13 to only 57%. This is probably due to differences in local priorities, the report says, because one-fifth of clinical CCGs and LHBs achieved over 90% participation. Clearly, something has to give when a major structural reorganisation is underway. Nevertheless, the proportion of the population registered in primary care as diabetic rose from 4.8% in 2013/14 to 5.1% in 2014/15. This is probably an underestimate: the Health Survey for England 2014 put the figure of doctor-diagnosed diabetes at 7.1% for men and 5.3% for women.

**Care processes**

NICE recommends nine care processes for people with diabetes aged 12 or over, of which eight are covered by the audit. (The ninth is retinal screening, which was not uniformly recorded by GPs.) In 2014/15, 39% of people with T1DM and 59% of those with T2DM received all eight
processes. Both figures are lower than the preceding year’s and there’s a hint of a slow decline in performance for people with T1DM (Figure 2). The problem is more severe in younger people, with only 27% of under-40s with T1DM receiving all eight processes compared with 58% of 65–79 year-olds; the corresponding figures for T2DM are 41% and 65%.

CGG/LHB performance last year was variable (Figure 3). The worst performers achieved all eight measures in only 17% of patients with T1DM, whereas the best achieved 62%. Carrying out routine blood tests and measuring blood pressure (BP) were the most frequently received processes, but here the wide variation in measuring HbA1c and serum cholesterol in patients with T1DM is surprising. Serum albumin and BMI were retired as QOF indicators during the audit period, and diligence in measuring them duly waned. The range of variation between CCGs/LHBs is narrowing, something the audit report says can be encouraged by sharing best practice and considering the impact on care of removing performance indicators.

The proportion of people newly diagnosed with diabetes who are offered structured education increased from 16% in 2012/13 to 67% and 76% in the next two years. This proportion was much greater for people with T2DM (78% vs 32% with T2DM). Yet only 5% of patients ever take up the offer and, the report says, commissioners and providers should be asking why.

**Treatment targets**

NICE has defined targets for glycaemic control (HbA1c ≤58 mmol/mol, 7.5%), BP (≤140/80 mmHg) and serum cholesterol (<5 mmol/L). The proportion of patients in whom all three targets are achieved remains low, especially in younger patients (Figure 4), with substantial variation between CCGs/LHBs (Figure 5). Only 30% of people with T1DM had an HbA1c of <58 mmol/mol (7.5%) compared with 66% of those with T2DM. The even more ambitious HbA1c target of HbA1c ≤48 mmol/mol (6.5%) was achieved by 8.7% of patients with T1DM and 29% of those with T2DM. The importance of measuring BP was stressed in recent reports and performance has been improving for several years, rising from 69% to 76% between 2009/10 and 2014/15 for T1DM and from 61% to 74% for T2DM. The report recommends a continued emphasis on BP measurement and more effort to achieve lower glucose levels in people of working age and younger.

**Conclusion**

Progress has been made in some aspects of care, albeit slowly in most instances. According to the performance indicators measured in the National Audit, most people with diabetes do not receive the comprehensive care they should and a large minority do not achieve the outcomes required from the interventions they do receive. The quality of care is worse for those with T1DM and for younger people. Further, though some parts of the country evidently deliver a high standard of care, others are failing the majority of their patients. We have known for some time that improved control of blood glucose and BP improves outcomes for people with diabetes. The morbidity, mortality and economic impact of long-term complications will not diminish until the NHS meets its targets.

The question of why patients do not take up the offer of education is in urgent need of an answer: is it an aspect of denial, or perhaps an assertion of personal control for someone whose management is highly directed? The audit report emphasises how important this is, stating: ‘The focus of all should be on how to increase the number of people who attend structured education.’

Steve Chaplin, BPharm, MSc, Medical Correspondent

**References**

References are available online at www.practicaldiabetes.com.

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**Figure 5. National Diabetes Audit. Range of clinical commissioning group/local health board NICE treatment target achievement. (Copyright © 2016, the Health and Social Care Information Centre)**

- **Type 1 diabetes**
  - HbA1c <48 mmol/mol (6.5%)
  - HbA1c ≤58 mmol/mol (7.5%)
  - HbA1c ≤86 mmol/mol (10.0%)
  - BP ≤140/80 mmHg
  - Cholesterol <4 mmol/L
  - Cholesterol <5 mmol/L
  - Meet all 3 treatment targets

- **Type 2 diabetes**
  - HbA1c <48 mmol/mol (6.5%)
  - HbA1c ≤58 mmol/mol (7.5%)
  - HbA1c ≤86 mmol/mol (10.0%)
  - BP ≤140/80 mmHg
  - Cholesterol <4 mmol/L
  - Cholesterol <5 mmol/L
  - Meet all 3 treatment targets

**Minimum** | **Median** | **Maximum** | **Interquartile range**
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**Type 1 diabetes** | | | |
HbA1c <48 mmol/mol (6.5%) | | | |
HbA1c ≤58 mmol/mol (7.5%) | | | |
HbA1c ≤86 mmol/mol (10.0%) | | | |
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Cholesterol <5 mmol/L | | | |
Meet all 3 treatment targets | | | |
References