

# Metabolic surgery



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**T**ype 2 diabetes prevalence is rising rapidly with several new cases diagnosed each week in our practices. Most of us would agree that, despite the plethora of drug treatment options for type 2 diabetes, management is often unsatisfactory. Eleven articles in the June edition of *Diabetes Care* report on the 2<sup>nd</sup> Diabetes Surgery Summit (DSS-II) conference, which took place in September 2015, and covered all aspects of “metabolic” surgery, providing us with a useful overview of this often forgotten new treatment option for type 2 diabetes.

## Metabolic and bariatric surgery

Metabolic surgery is defined as the use of gastrointestinal surgery to treat type 2 diabetes and obesity. The new recommendations from the DSS-II and public discussion published in a Joint Statement by International Diabetes Organizations seek to identify the appropriate place of metabolic surgery in the treatment algorithm (Rubino et al, 2016). So what are the differences between bariatric and metabolic surgery? Whereas the criterion for selection for bariatric surgery is BMI and the goal is weight reduction, metabolic surgery selection needs to be based on the severity of type 2 diabetes and what surgery offers compared to intensive medical treatment for diabetes. People seeking bariatric surgery are often young, female and seeking weight reduction, while those seeking metabolic surgery are more likely to be older, male, with severe type 2 diabetes and cardiovascular disease (CVD; Rubino et al, 2014). As with bariatric surgery, metabolic surgery perioperative management must encompass changing needs for diabetes medication and potential destabilisation of existing diabetes complications.

The guidance for metabolic surgery for the management of diabetes (Rubino et al, 2016) is similar to the recommendations in the NICE (2014) obesity guideline, although no distinction is made between recent-onset or long-term type 2 diabetes. Recommendations are that metabolic surgery should be recommended to treat type 2 diabetes in people with class III obesity (BMI

≥40 kg/m<sup>2</sup>) and in those with class II obesity (BMI 35–39.9 kg/m<sup>2</sup>) when hyperglycaemia is inadequately controlled by lifestyle and optimal medical therapy. Surgery should also be considered for those with type 2 diabetes and a BMI of 30–34.9 kg/m<sup>2</sup> if hyperglycaemia is inadequately controlled, despite optimal treatment with either oral or injectable medications. BMI values should be reduced by 2.5 kg/m<sup>2</sup> for people of Asian background. Throughout the document, it is not explicit whether insulin treatment (which would worsen BMI) should be used before referral to surgery.

Despite the recommendations, we must remember that there are, as yet, few data from randomised controlled trials on the impact of surgery on microvascular and macrovascular complications of type 2 diabetes (Adams et al, 2016). Although remission rates for diabetes at 2 years’ post-surgery were 72%, they fell to 36% by 10 years (Sjostrom et al, 2004), and there are significant long-term adverse effects of surgery including vitamin and mineral deficiencies, bone loss and gastrointestinal problems. Around one in five of those undergoing laparoscopic gastric banding developed significant complications (Thornton et al, 2009). Reassuringly, perioperative morbidity (5%) and mortality (0.3%) are comparable or less than rates associated with laparoscopic cholecystectomy (Schouer et al, 2016) and patients report significant improvements in quality of life.

Reminding ourselves that half of new cases of type 2 diabetes will come from the 20% of the population at high risk of developing the disease, with the other half from the remaining 80% (Zimmet and Alberti, 2016) is helpful both in encouraging us to redouble our efforts to identify those with pre-diabetes, and in considering surgical intervention in diabetes prevention, particularly if there are also other CV risk factors.

Recent television coverage of these guidelines has raised the expectations among people with type 2 diabetes, and current UK bariatric surgery provision (6000 per year according to

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Diabetes UK) would not support implementation of these guidelines. Seven out of 45 experts involved in the DSS-II conference are from the UK, so lobbying is likely to result in increased funding and availability of metabolic surgery. Learning more about the effects of metabolic surgery will help us explain to patients how surgery works and that its mechanism in type 2 diabetes remission is much more complex than just caloric restriction. Combined with identifying local bariatric surgery referral criteria (and whether they change in response to these guidelines), this may help guide us through challenging consultations.

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### **Glycaemic “legacy effect” and tight composite risk factor control both reduce CVD risk**

CVD remains the main cause of mortality among people with type 2 diabetes; CVD mortality and morbidity are up to three times higher in men, and up to five times higher in women with diabetes compared to those without. The recent focus of *Diabetes Care* on possible mechanisms linking CVD and type 2 diabetes, and how recent positive studies such as the EMPA-REG OUTCOME study can be applied to our practice (Abdul-Ghani et al, 2016), provides a useful update. Overall, the studies reviewed continue to support the notion that early tight glycaemic control prior to development of CVD provides a beneficial “legacy effect” on CVD risk some 10 or 20 years later. They also support the notion that once CVD is established, tight glycaemic control alone is unlikely to reduce CVD risk (Cefalu et al, 2016).

The (ARIC) Atherosclerosis Risk in Communities study confirmed an increased risk of all-cause hospitalisation including for CVD and endocrine reasons in those with diabetes, undiagnosed diabetes and also in those with pre-diabetes (Schnieder et al, 2016).

As part of three large multi-ethnic US studies, which included over 2000 people with type 2 diabetes and no known pre-existing CVD, the reviewers identified those who achieved none,

one, two or three of the targets of LDL-cholesterol (<2.6 mmol/L), blood pressure (BP; <130/80 mmHg) and HbA<sub>1c</sub> (<53 mmol/mol; 7%). People were followed for 11 years and a clear inverse relationship was found between the number of goals achieved and the risk of both CVD and coronary heart disease (CHD), with 62% lower risk of CVD and 60% lower risk of CHD in those with all three goals met versus those who did not meet any goals. In this study, less than one in 10 people achieved all three of these tight goals at the same time (Wong et al, 2016).

This almost exactly duplicated the findings from the much smaller Steno-2 study (Gaede et al, 2003). This study demonstrated a 57% relative risk reduction in CV death (20% absolute risk reduction; number needed-to-treat 5) and a 59% reduction in CV events when glycaemia, BP and lipids were tightly controlled over the mean follow-up period (7.8 years), together with a “legacy effect” of benefit over the ensuing 5.5 years’ post-study follow-up (Gaede et al, 2008).

It has been projected that poor CVD risk factor control may be responsible for 11–34% of CVD events. Other studies suggest that facilitating self-management including smoking cessation, and drug therapy to control all CVD risk factors, may prevent up to 42% or 62% of CHD events depending on how aggressive the control imposed.

### **UK outcomes**

So how well are we achieving the three key processes across the UK? *The National Diabetes Audit Report 1: Care processes and treatment targets for 2014/15*, published earlier this year reported data on practices in England and Wales participating in the National Diabetes Audit (Health and Social Care Information Centre, 2016).

- More than 90% of people with type 2 diabetes in England and Wales had HbA<sub>1c</sub>, BP and total cholesterol measured.
- The recommended HbA<sub>1c</sub> target of ≤58 mmol/mol (7.5%) was achieved in 66%, the target cholesterol (TC) level of ≤5 mmol/L was achieved in 77.5% and the BP target of ≤140/80 mmHg was achieved in 74%. All three targets were only achieved in 41% of people.

● In our own practice in Wales, as part of a pilot project, we have “real time” feedback on our achievements on the National Diabetes Audit care processes. Currently, 59% of people with type 2 diabetes meet the HbA<sub>1c</sub> target (compared with 63% across Wales), 70% the TC level (73% across Wales) and more than 76% achieved the BP target (73% across Wales). Just under 40% achieved the targets for all three goals (38% across Wales), so we have significant work to do, particularly on our HbA<sub>1c</sub> targets. Feedback such as this on both individual risk factors and on our composite target achievements is useful in motivating us to improve the care we deliver.

### Individualisation, inertia and challenging treatment decisions

These topics, which continue to tax us, were well presented and enthusiastically debated during the Welsh PCDS conference in May. My grateful thanks to all our speakers who made time to attend and share their expertise, to our sponsors and exhibitors who facilitated and added to our educational experience, to our conference team and, most importantly, to colleagues who made the time to attend and who participated so fully on the day. I'm already looking forward to planning the programme for next year.

In this edition of the Journal, we include discussion on treatment choices for glycaemic control (page 135) and an updated CPD module on blood pressure by Roger Gadsby (page 139). A team at Sandwell and West Birmingham Hospitals NHS Trust discuss the steps they've taken to reduce insulin-related harm in hospitals (page 115) and, in our Around the Nations series, we have an update on the progress of the SCI-Diabetes programme in Scotland (page 111). Our final comment in this issue is from Jim O'Brien, National Programme Director for the NHS Diabetes Prevention Programme (page 113). Jim shares data from the programme demonstrator sites, as well as explaining where the programme is in terms of national roll out. We hope to keep you informed with further developments and please get in touch with your experiences at [dpc@omniamed.com](mailto:dpc@omniamed.com) if you are part of the first wave of implementation.

The first in our series on legal issues is on page 131, and we provide food for thought around the Chancellor's recent announcement of a UK “sugar tax” with a review of the impact food taxes have had in other countries (page 126). We'd like to know what you think about the industry-targeted sugar levy proposed in the 2016 Budget, so turn to page 118 for information on how to access the survey. There you can also read the results from the insulin safety survey launched in the last issue. There is another opportunity to audit our care delivery on page 120, this time to ensure that we review those on metformin or sulfonylurea to amend dose or stop therapy based on their renal function. ■

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