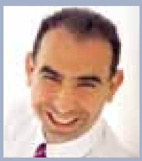
Obesity

Bariatric surgery for people with lower BMI and T2D



Shahrad Taheri, Senior Lecturer in Endocrinology, University of Birmingham, Birmingham

Based on currently available data, bariatric surgery has demonstrated clinical- and cost-effectiveness for treatment of extreme obesity (Picot et al, 2009). While NICE (2006) recommends bariatric surgery as an important option for people with obesity (BMI >35 kg/m^2 with T2D, or BMI ≥40 kg/m^2 without comorbidity), less than 0.5% of eligible individuals receive bariatric surgery annually in the UK.

The BMI cut-points adapted by several guidelines stem from guidance set over 20 years ago, when bariatric surgery was less safe than today and its benefits were less appreciated (National Institutes of Health, 1992). These guidelines, with emphasis on BMI, did not take into account the severity of comorbidities and the fact that BMI cut-points for obesity comorbidities and complications are lower for several ethnic groups. Recently, the International Diabetes Federation recommended bariatric surgery for those with a BMI >30 kg/m^2 where diabetes and other comorbidities are not controlled by optimal medical therapy (Dixon et al, 2011). This leads to the question of whether bariatric surgery should be an important option for those with lower BMI and T2D.

Li et al (2011; summarised alongside) carried out a meta-analysis – complementing similar studies looking at diabetes improvement or remission after bariatric surgery (Buchwald et al, 2009; Meijer et al, 2011) – to examine the metabolic effects of bariatric surgery in T2D in those with a BMI <35 kg/m^2. They found 13 studies fulfilling their review protocol, 11 of which were prospective. These studies show how sparse the available data is, highlighting the small number of participants in each study (n=5–69), and the lack of studies with sufficient long-term follow-up (only two studies beyond 5 years). Additionally, the surgical procedures used were diverse (five different procedures) and none used the laparoscopic adjustable gastric band, which is the procedure currently used in about 40% of patients. There were no UK-based studies.

The meta-analysis generally reported significant reductions in body weight, BMI and waist circumference, and improvement in lipids. Importantly, there were improvements in fasting plasma glucose (FPG) and HbA_{1c} levels; 80% achieved adequate glycaemic control (HbA_{1c} <53 mmol/mol [<7%]) without antidiabetes medications, and 66% achieved an HbA_{1c} level <42 mmol/mol (<6%). While these findings are impressive, the impact of bariatric surgery tends to be somewhat less remarkable in practice where patients are unselected.

While the work of Li et al is of interest and shows beneficial effects of bariatric surgery, based on the limitations discussed above, the studies included are insufficient to alter current practice in bariatric surgery. Any bariatric surgery for those with lower BMI and diabetes has to be contemplated with care. Bariatric surgery is increasingly safer, but the procedures used are associated with potential long-term issues such as nutritional deficiencies and their sequelae, particularly for more malabsorptive procedures, which appear to be most effective for diabetes improvement. There is also a common assumption that medical approaches are ineffective even though they are not fully implemented.

There is now an array of novel diabetes treatments available (such as the incretin-based therapies) that, when combined with appropriate support, can result in significant weight loss as well as diabetes improvement. Further randomised clinical trials with long-term follow-up are needed to compare best current medical treatment with bariatric surgery in the lower BMI group. Studies will also need to examine effects on diabetes complications.

Certainly, the BMI cut-points for bariatric surgery should be appropriately lower for high-risk ethnic groups such as south Asian people. The immediate problems, however, include the fact that only a small percentage of people of any ethnicity fulfilling criteria for bariatric surgery are given the opportunity to benefit from it. Also, insufficient numbers of people from ethnic groups, including those who fulfil current BMI criteria, are coming forward or are referred for bariatric surgery. Greater engagement and education is needed to improve diabetes and knowledge regarding available treatments in high-risk populations.

Buchwald H, Estok R, Fahrbach K et al (2009) Weight and type 2 diabetes after bariatric surgery: systematic review and meta-analysis. *Am J Med* **122**: 248–56

Dixon JB, Zimmet P, Alberti KG et al (2011) Bariatric surgery: an IDF statement for obese type 2 diabetes. *Diabet Med* **28**: 628–42

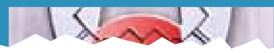
Meijer RI, van Wagensveld BA, Siegert CE et al (2011) Bariatric surgery as a novel treatment for type 2 diabetes mellitus: a systematic review. *Arch Surg* **146**: 744–50

National Institutes of Health (1992) Gastrointestinal surgery for severe obesity: National Institutes of Health Consensus Development Conference Statement. *Am J Clin Nutr* **55**(2 Suppl): 615S–9S

NICE (2006) *Obesity: Guidance on the Prevention, Identification, Assessment and Management of Overweight and Obesity in Adults and Children.* NICE, London

Picot J, Jones J, Colquitt JL et al (2009) The clinical effectiveness and cost-effectiveness of bariatric (weight loss) surgery for obesity: a systematic review and economic evaluation. *Health Technol Assess* **13**: 1–190, 215–357, iii–iv

DIABETES, OBESITY AND METABOLISM



Bariatric surgery effective in T2D with a BMI <35 kg/m^2

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

1 It is established that bariatric surgery in obese people with a BMI >35 kg/m^2 and T2D profoundly reduces the clinical manifestations of diabetes.

2 As the risks associated with diabetes and its comorbidities occur at a lower BMI in south Asian people, the objective of this study was to assess whether bariatric surgery in non-obese people (BMI<35 kg/m^2) would reverse the effects of T2D. Primary outcome measures were metabolic improvement and T2D resolution following surgery.

3 A systematic literature review identified 13 trials comprising 357 people with T2D and a who underwent bariatric surgery; follow-up ranged from 6 months to 18 years.

4 Bariatric surgery was associated with a mean BMI reduction of 5.18 kg/m^2 (95% confidence interval [CI], 3.79–6.57; P<0.00001). Moreover, surgery led to a decrease in fasting plasma glucose (FPG) of 4.8 mmol/L (95% CI, 3.88–5.71 mmol/L; P<0.00001) and reduction in HbA_{1c} of 28.3 mmol/mol (2.59%; 95% CI, 2.12–3.07%; P<0.00001).

5 Significant reductions were also observed in triglyceride and cholesterol levels (P=0.01 and P=0.0005, respectively);

6 In total, 80% of participants achieved an HbA_{1c} level <53 mmol/mol (<7%) without antidiabetes drugs.

7 It was concluded that bariatric surgery is safe and effective in people with a BMI <35 kg/m^2 and T2D, and yields sustained metabolic benefits.

Li Q, Chen L, Yang Z et al (2011) Metabolic effects of bariatric surgery in type 2 diabetic patients with body mass index <35 kg/m^2. *Diabetes Obese Metab* **Nov 3** [Epub ahead of print]

DIABETOLOGIA

Men develop T2D at lower BMI than age-matched women

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

1 Although a high BMI is a major risk factor for developing T2D, other factors influence risk such as age and genetic profile.

2 Studies have indicated that middle-aged men are at higher risk of developing T2D than women, possibly because men can develop T2D with less weight gain than women.

3 This study aimed to determine the relationship between age, sex and BMI at T2D diagnosis and whether men develop diabetes at lower average BMI than age-matched women.

4 Data were analysed from a population-based diabetes register in Scotland; in total, 51 920 men and 43 137 women had an index BMI measurement taken within 1 year of diagnosis of T2D.

5 The mean BMI recorded within a year of diagnosis in men was 31.83 kg/m^2 (standard deviation [SD], 5.13) and in women was 33.69 kg/m^2 (SD, 6.43).

6 The inverse relationship between age and BMI near diagnosis was significantly steeper in women; slope estimate in men was –0.12 kg/m^2/year (95% confidence interval [CI], –0.13 to –0.12) and in women was –0.18 kg/m^2 (95% CI, –0.18 to –0.17) (P<0.0001).

7 Mean BMI difference was most marked at younger ages, and lessened with increasing age; HbA_{1c} levels within 1 year of diagnosis were similar for men and women.

8 It was concluded that at most ages men are diagnosed with T2D with a lower BMI than women, which may explain why T2D is more prevalent in middle-aged men.

Logue J, Walker JJ, Colhoun HM et al (2011) Do men develop type 2 diabetes at lower body mass indices than women? *Diabetologia* **54**: 3003–6

DIABETES CARE

Lifestyle impacts on mortality in T2D

Readability	✓✓✓✓
Applicability to practice	✓✓✓
WOW! factor	✓✓✓

1 This study aimed to assess whether unhealthy lifestyle behaviours had an impact on mortality in 5686 people aged 30–94 years with T2D.

2 Mortality rate was 24.10 (men) and 17.25 (women) per 1000 person-years. Most deaths (72.26%) were caused by cancer (n=122), diabetes (n=105) or CVD (n=83); after adjustments, a combined unhealthy lifestyle behaviour was independently associated with all-cause mortality and diabetes-, cardiovascular disease (CVD)-, and cancer-specific mortality.

3 Participants with more than three unhealthy lifestyle behaviour points had a 3.50-fold increased risk of all-cause mortality, and a 4.94-, 4.24- and 1.31-fold increased risk of diabetes-, CVD- and cancer-specific mortality.

4 The authors concluded that combined lifestyle behaviour is a strong predictor of all-cause and cause-specific mortality in people with T2D.

Lin C-C, Li C-I, Liu C-S et al (2011) Impact of lifestyle-related factors on all-cause and cause-specific mortality in patients with type 2 diabetes. *Diabetes Care* **35**: 105–12

DIABETES, OBESITY AND METABOLISM

Obesity at insulin initiation linked with poor target results

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

1 As excess weight is a risk factor for increased insulin resistance and worsening of glycaemic control in people with T2D, managing weight is essential to achieve glycaemic targets.

2 The authors performed a retrospective primary care database study to determine the relationship between weight at insulin initiation and attainment of glycaemic targets.

3 In total, 3783 participants were included: 672 normal weight, 1259 overweight, 1070 obese, 480 clinically obese and 302 morbidly obese.

4 Median HbA_{1c} at initiation and 6 months was 83 mmol/mol (9.7%) and 63 mmol/mol (7.9%) in people who were normal weight and 81 mmol/mol (9.6%) and 66 mmol/mol (8.2%) in people who were clinically obese; the largest HbA_{1c} reductions were achieved in the normal weight group.

5 Obesity was linked with higher HbA_{1c} values and low target attainment.

Watson L, Wilson BP, Alsop J, Kumar S (2011) Weight and glycaemic control in type 2 diabetes: what is the outcome of insulin initiation? *Diabetes Obese Metab* **13**: 823–31

DIABETES CARE

GLP-1 is involved in glucose control after a gastric bypass

Readability	✓✓✓✓
Applicability to practice	✓✓✓
WOW! factor	✓✓✓

1 Enhanced glucagon-like peptide-1 (GLP-1) levels partially explain improved diabetes control after gastric bypass surgery (GBS).

2 As the long-term clinical outcome after GBS differs between patients, with a diabetes relapse in up to 30%, the authors determined the effect of GLP-1 on blood glucose control up to 2 years after GBS.

3 Blood glucose and GLP-1 levels were measured before, 1, 12 and 24 months after GBS in 15 severely obese people with T2D.

4 An increase in variance of GLP-1 was observed 1–2 years after GBS.

5 It was concluded that the link between GLP-1 and insulin concentration supports the role of GLP-1 in glycaemic control after GBS.

Van der Schueren BJ, Homel P, Alam M et al (2011) Magnitude and variability of the glucagon-like peptide-1 response in patients with type 2 diabetes up to 2 years following gastric bypass surgery. *Diabetes Care* **35**: 42–6

“The link between glucagon-like peptide-1 (GLP-1) and insulin concentration supports the role of GLP-1 in glycaemic control after gastric bypass surgery.”