Metabolic effects bariatric surgery in residents of the UAE with type 1 diabetes

Mohamed Suliman[1], Adam Buckley[2], Nader Lessan[2] and Maha T Barakat[2]
1 Imperial College London Diabetes Centre, (Al Ain, United Arab Emirates)
2 Imperial College London Diabetes Centre, (Abu Dhabi, United Arab Emirates)

Background

The use of metabolic surgery for the treatment of type 2 diabetes is well documented. There are no prospective trials of the use of metabolic surgery in patients with type 1 diabetes, and only small case series in other populations have been published. Obesity is increasingly common in people with type 1 diabetes.

Aims

To examine effects of metabolic surgery on weight, glycaemic control, lipid profile and insulin dose in residents of the UAE with type 1 diabetes mellitus.

Method

We retrospectively reviewed insulin dose, anthropometry and metabolic parameters in 11 patients who attended Imperial College London Diabetes Centre for management of type 1 diabetes mellitus both before and following metabolic surgery. Median values for each parameter before and following procedures were compared using the matched-pairs Wilcoxon signed rank test.

Results

Eleven individuals with type 1 diabetes were identified through examination of patient records and through physician recall. Patients underwent bariatric surgery between January 2013 and February 2017. Two individuals reported being treated with Roux-en-Y procedure, five underwent sleeve gastrectomy, and four individuals did not report the nature of the procedure performed.

The median BMI before surgery was 33.0 (27.9-34.0) kg/m2 while median BMI following surgery was 28.5 (25.3-31.4) kg/m2. The median change in weight following metabolic surgery was 18.5 (17.2-26.4) kg, equivalent to a median change of weight of 18.5 percent. This difference was significant, $p<0.01$.

There was a trend ($p=0.058$) towards improvement in glycaemic control with a median HbA1c of 7.70 (7.23-8.02)% after, compared to 8.30 (7.68-8.95)% prior to surgery. Total insulin dose was significantly reduced following surgery to 50 (46-64) units compared to. 85 (60-116) units prior to the operation ($p < 0.01$); the median reduction in total daily insulin dose was 32%.

There was a significant ($p<0.05$) reduction in median LDL from 2.67 (2.46-2.80) mmol/L to 2.29 (2.07-2.52) mmol/L following metabolic surgery. Neither HDL (1.41 (1.13-1.51) mmol/L cf. 1.36

(1.21-1.40) mmol/L, p=0.49) nor triglycerides (0.71 (0.65-1.05) mmol/L cf. 1.07 (0.86-1.18) mmol/L, p=0.06) were significantly altered.

Discussion

In this patient cohort, the use of metabolic surgery was associated with significant and beneficial changes in weight, total daily insulin requirement and LDL cholesterol, although there were no significant changes in HbA1c, HDL or triglycerides. This finding is in line with other recently reported patient cohorts. Metabolic surgery may be beneficial in patients with coexisting type 1 diabetes and obesity.