Impact of bariatric surgery on type 2 diabetes in morbidly obese patients and its correlation with pre-operative prediction scores

Mehul Gupta, Sandeep Aggarwal, [...], and Rachna Chaudhary

Abstract

Background:

Bariatric surgery, besides causing significant weight reduction, leads to improvement in type 2 diabetes mellitus (T2DM). However, there is a scarcity of data on the prediction of diabetes resolution in non-Western population.

Objective:

To evaluate the impact of bariatric surgery on T2DM and to assess the accuracy of pre-operative scoring systems in predicting remission.

Study Setting:

A tertiary care academic centre, India.

Methodology:

We used a retrospective cohort of all diabetic patients (n = 244) who underwent bariatric surgery at our centre in the past 10 years. The cohort was followed up for diabetes remission, and pre-operative scoring systems were analysed against the observed results.

Results:

Of 244 patients, we were able to contact 156 patients. The median period of follow-up was 38 months. The mean body mass index (BMI) of the study group decreased from 45.4 to 33.4 kg/m^2 (%excess BMI loss = 61.2%). The number of patients dependent on oral anti-diabetic pharmacotherapy and on insulin decreased from 133 (85.3%) to 40 (25.6%) and from 31 (19.9%) to 7 (4.5%), respectively. Remission was analysed for 96 patients, who submitted complete biochemical investigations. The median follow-up period for this sub-cohort was 36 months. 38 (39.6%) patients were in complete remission, 15 (15.6%) patients in partial remission and 34 (38.5%) patients showed an improved glycaemic control. The three pre-operative scores, Advanced-DiaRem, DiaRem and ABCD, showed predictive accuracies of 81.1%, 75.6% and 77.8%, respectively.

Conclusions:

Besides leading to excess BMI loss of 61.2%, bariatric surgery also resulted in diabetes remission in 55.2% of the patients. Amongst various pre-operative scores, Advanced-DiaRem has the highest predictive accuracy for T2DM remission.

Keywords: Bariatric surgery, diabetes remission, Indian, morbid obesity, non-Western, scoring

INTRODUCTION

The risk of developing type 2 diabetes mellitus (T2DM) is 50-fold higher for the obese population, as compared to their non-obese counterparts.[1,2] As a result, the recent increase in the prevalence of obesity has caused a parallel rise in the prevalence of diabetes. Bariatric surgery causes significant weight reduction and has also shown to cause improvement in glycaemic control of diabetic patients.[3,4] Remission rates are as high as 75%–80% at 1 year of follow-up[5] and then decrease progressively with time. Medium-term and long-term remission rates have been reported to be at around 60%–65% and 50%, respectively.[6,7,8] The success of metabolic surgery in causing remission of T2DM depends on various factors such as body mass index (BMI), age, duration of diabetes and pre-operative glycaemic control. Various scoring systems such as ABCD,[9] DiaRem[10] and Advanced-DiaRem (Ad-DiaRem)[11] derived from these variables Appendix 1 have been developed to predict the probability of diabetes remission after bariatric surgery.

The DiaRem and Ad-DiaRem scoring systems were developed through studies on the Western population. A study done in 2017 targeted a more diversified cohort and suggested that the predictive value of DiaRem score may vary in different ethnic groups.[12] Asians are known to have a higher prevalence of T2DM than their Western counterparts. They also might not have the same response to bariatric surgery as the Western population as