



Original article

Preoperative insulin therapy as a marker for type 2 diabetes remission in obese patients after bariatric surgery

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Abstract

Background: Obesity not only increases the chances of developing diabetes—one of the top causes of death in the United States—but also results in further medical complications.

Objective: To compare the 6-month and 1-year postoperative remission rates of type 2 diabetic (T2D) patients after bariatric surgery based on preoperative glycosylated hemoglobin (HbA1C) stratification and pharmacologic therapy: insulin-dependent diabetic (IDD) versus noninsulin-dependent diabetic (NIDD).

Setting: Academic hospital, United States.

Methods: We retrospectively analyzed a prospectively maintained database of 186 obese patients with a diagnosis T2D who had undergone either a sleeve gastrectomy or a Roux-en-Y bypass surgery at our hospital.

Results: At 6-months ($n = 180$), patients who were stratified by preoperative HbA1C levels (<6.5 ; ≥ 6.5 to <8 ; ≥ 8) had 70.5%, 51.7%, and 30.0% remission rates ($P < .001$) and at 1 year ($n = 118$) patients had 72.0%, 54.0%, and 42.8% remission rates ($P = .053$), respectively. When patients were substratified by preoperative pharmacologic therapy, IDD and NIDD patients had different remission rates within the same HbA1C level. At 6-months follow-up within HbA1C ≥ 6.5 to <8 (IDD versus NIDD), the remission rate was 23.5% versus 64.1% (odds ratio [OR]: .173, confidence interval [CI]: .0471, .6308, $P = .0079$), and within HbA1C ≥ 8 the remission was 24.0% versus 37.5% (OR: .5263, CI: .2115, 1.3096, $P = .1676$), respectively. At 1-year follow-up within HbA1C ≥ 6.5 to <8 , the remission rate was 30.0% versus 62.9% (OR: .2521, CI: .0529, 1.2019, $P = .0838$), and within HbA1C ≥ 8 the remission was 31.4% versus 61.9% (OR: .2821, CI: .0908, .8762, $P = .0286$), respectively. Furthermore, when IDD patients were compared between HbA1C ≥ 6.5 to <8 and HbA1C ≥ 8 the remission rates were nearly identical; and for NIDD patients HbA1C was not significantly associated with remission regardless of the level, except at 6 months.

Conclusion: While a difference was observed between overall HbA1C levels—the lower the HbA1C level, the higher the remission rate—IDD patients had lower remission rates than NIDD patients irrespective of HbA1C levels; further, IDD patients performed similarly across HbA1C levels. (Surg Obes Relat Dis 2017;■:00–00.) © 2017 American Society for Metabolic and Bariatric Surgery. All rights reserved.

Keywords: Type 2 diabetes; HbA1C levels; Insulin-dependent diabetes; Noninsulin-dependent diabetes

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Type 2 diabetes (T2D) is a serious chronic medical condition that can cause cardio-cerebrovascular disease, a range of cognitive and mood disorders, metabolic bone disorders, and even certain cancers [1]. It is considered one of the top 10 causes of death in the United States and is

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strongly correlated with obesity [2]. The International Diabetes Federation reports that 366 million people worldwide suffered from T2D in 2011 and projects that 552 million will be affected by 2030 [3].

The prevalence of obesity is higher in T2D patients than in the general population, and obesity is the primary risk factor for T2D [4]. The interdependence of diabetes and obesity, the early stages of which lead to the progression of diabetes, is referred to as “Diabesity” [5]. While a variety of treatment options exist for T2D patients with a body mass index (BMI) ≥ 35 , bariatric surgery has proven to be an effective treatment option [6].

Although many studies have reported on the predictive factors for postoperative T2D remission, including disease duration, severity, patient age and sex, type of procedure, glycosylated hemoglobin (HbA1C) level, BMI < 50 , and the effect of postsurgical weight loss, among others, few investigators have focused on the impact of preoperative pharmacotherapy on T2D remission rates [7–11]. HbA1C levels have often been used to assess a patient’s disease status, initiate or discontinue treatment, and even predict postoperative remission; however, the purpose of this study was to further understand and expand on the current literature on the impact of preoperative pharmacologic therapy for T2D on postoperative remission rates, beyond HbA1C levels.

Methods

Study population

All research was conducted with the approval of the institutional review board. We retrospectively analyzed a prospectively maintained database of 186 obese patients with a diagnosis of T2D who had undergone either a sleeve gastrectomy (SG) or a Roux-en-Y gastric bypass (RYGB) at our hospital between 2011 and 2015.

Patient inclusion and exclusion

The study includes all male and female adult patients with a baseline status of T2D, HbA1C levels, and pharmacologic treatment, as well as a T2D remission status at 6-months and/or 1-year follow-up (Fig. 1). T2D patients lost to follow-up at both 6 months and 1 year were excluded, as were patients with < 6 -months follow-up.

Diabetes status

T2D status was determined based on HbA1C < 6.5 (well-controlled diabetes), HbA1C ≥ 6.5 to < 8 (diabetes), and HbA1C ≥ 8 (poorly controlled diabetes). The HbA1C stratification is based on our institutional guidelines and adheres to the “Clinical Practice Guidelines for the

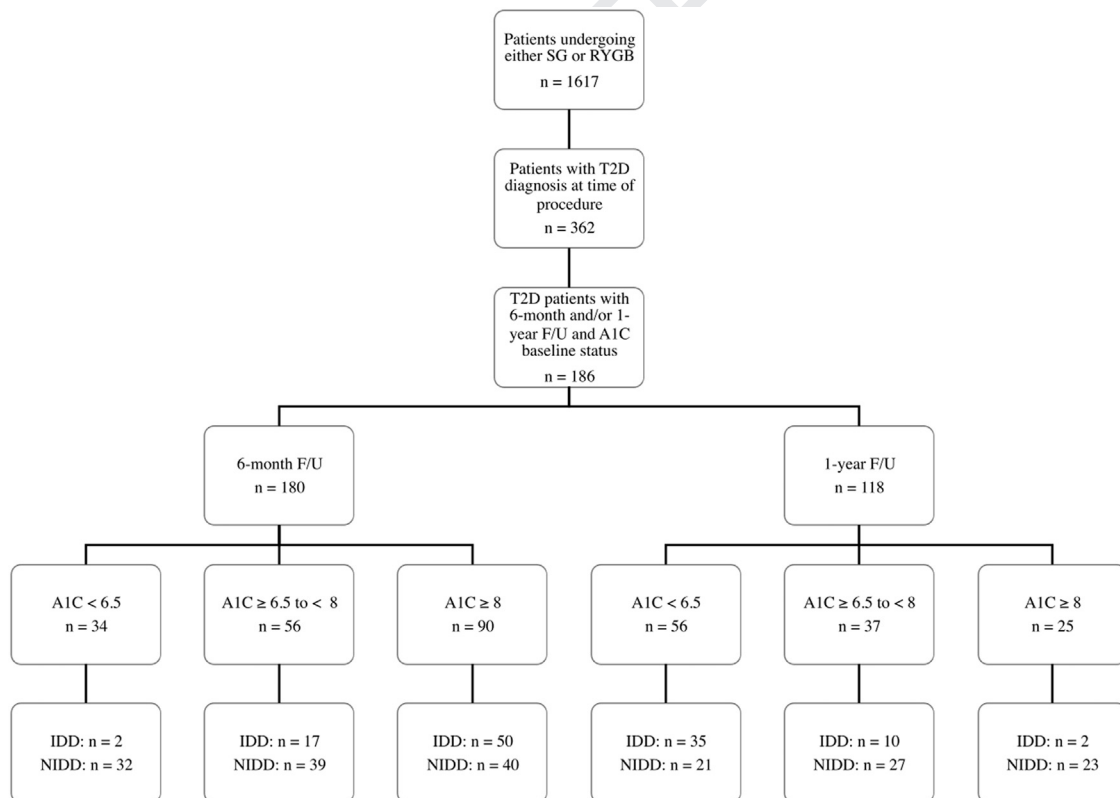


Fig. 1. Flowchart of eligible and available patients included in the study at each follow-up period. T2D = type 2 diabetes; HbA1C = glycosylated hemoglobin; RYGB = Roux-en-Y bypass surgery; SG = sleeve gastrectomy; IDD = insulin-dependent diabetes; NIDD = noninsulin-dependent diabetes; F/U = follow-up.

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