

Bariatric Metabolic Outcomes Project - BMOP

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SCIENCE FOR THE BENEFIT OF HUMANITY



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Background

- Increasing popularity of bariatric surgery as a treatment option for obese individuals
 - Type 2 diabetes mellitus
- Bariatric surgery has generally proven to be superior to diet and exercise
 - Sustained weight loss
 - Improvement in glucose homeostasis
- There are still questions that remain:
 - Do certain patient populations benefit more from bariatric surgery versus medical weight loss alone?
 - In whom will the metabolic improvements be sustained?

Key Attributes of the RU-CDN Translational Research Model

- Embedding basic science & mechanistic questions into clinical studies conducted in practice-based settings
- Engaging FQHCs and Primary Care Clinicians

Study Hypothesis

We hypothesized that patient baseline clinical and laboratory characteristics may accurately inform who will respond to bariatric surgery with significant and sustained metabolic improvement.

EHR Study

Inclusion Criteria

EHR data from November, 2010- to December 31st 2014

One of the following procedures:

- RYGB - 43644
- VSG - 43775
- LAGB - 43770

Baseline evaluation:

- With pre-surgical (within 3 months prior to surgery) evaluation
- With at least two clinical evaluations post-surgery (within 6 months post surgery)
- Follow-up could be in Surgery, Primary Care, Cardiology, Endocrinology, Nephrology

Diagnosis:

- Obesity – 278.00
- T2DM – 250.00

Variables from EHRs

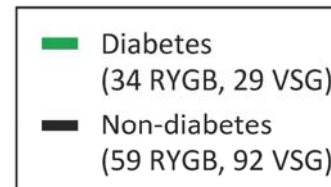
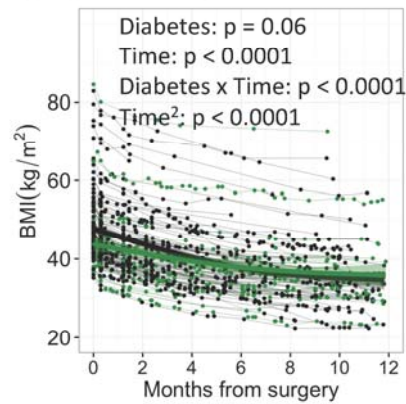
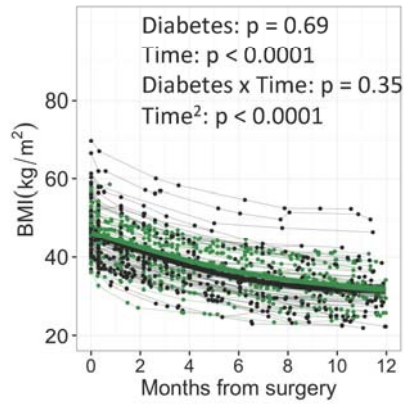
- **Demographics**: age, gender, ethnicity, insurance, zip code
- **Medical**: hypertension, diabetes, diabetes duration, dyslipidemia, OSA, use of CPAP, diagnosis of RA, depression
- **Clinical characteristics**: weight, BMI
- **Prescription drugs**: anti-hypertensives, anti-diabetics, statins, fibrates, niacin, weight loss, aspirin, steroids
- **Laboratory parameters**: hemoglobin A1C, fasting blood glucose, CBC, CMP, cholesterol, triglycerides, PHQ2/9

Table 1. Clinical Characteristics of the Patients at Baseline

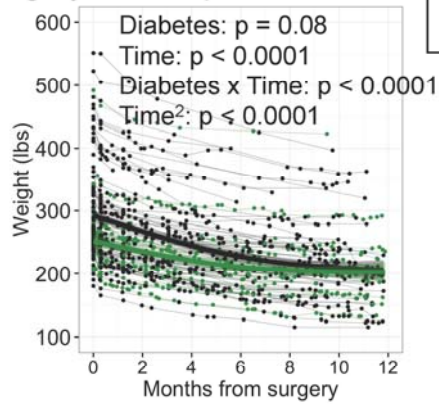
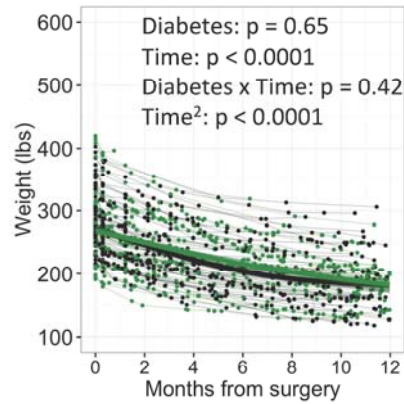
Characteristic	RYGB (n = 93)	VSG (n = 121)	P-value
Demographics, Vitals, and Labs			
Age (years)	42.2 ± 10.5	38.9 ± 11.4	0.03
Female	83 (89.2%)	99 (81.8%)	0.13
Hispanic ethnicity	50 (53.8%)	57 (47.1%)	0.57
BMI (kg/m ²)	47.8 ± 6.6	48.4 ± 9.4	0.58
Weight (lbs)	283.3 ± 54.1	293.8 ± 73.4	0.25
Systolic BP (mm Hg)	124.2 ± 15.5	124.1 ± 16.3	0.98
Diastolic BP (mm Hg)	77.4 ± 8.4	77.1 ± 8.5	0.80
Hemoglobin A1c (%)	8.0 ± 1.8	6.9 ± 0.8	0.04
Glucose	126.7 ± 34.4	111.5 ± 42.5	0.18
Comorbid Conditions			
Depression	17 (18.3%)	22 (18.2%)	0.99
Diabetes	34 (36.6%)	29 (24.0%)	0.05
Hyperlipidemia	29 (31.2%)	28 (23.1%)	0.19
Hypertension	46 (49.5%)	52 (43.0%)	0.35
Hypertriglyceridemia	3 (3.2%)	3 (2.5%)	1.00
Sleep apnea	51 (54.8%)	73 (60.3%)	0.42

Data are presented as mean ± SD for continuous variables or n and percentage for categorical variables. Abbreviations: RYGB, Roux-en-Y gastric bypass; VSG, vertical sleeve gastrectomy; BMI, body mass index; BP, blood pressure.

Diabetes x Surgery x Time: $p=0.006$

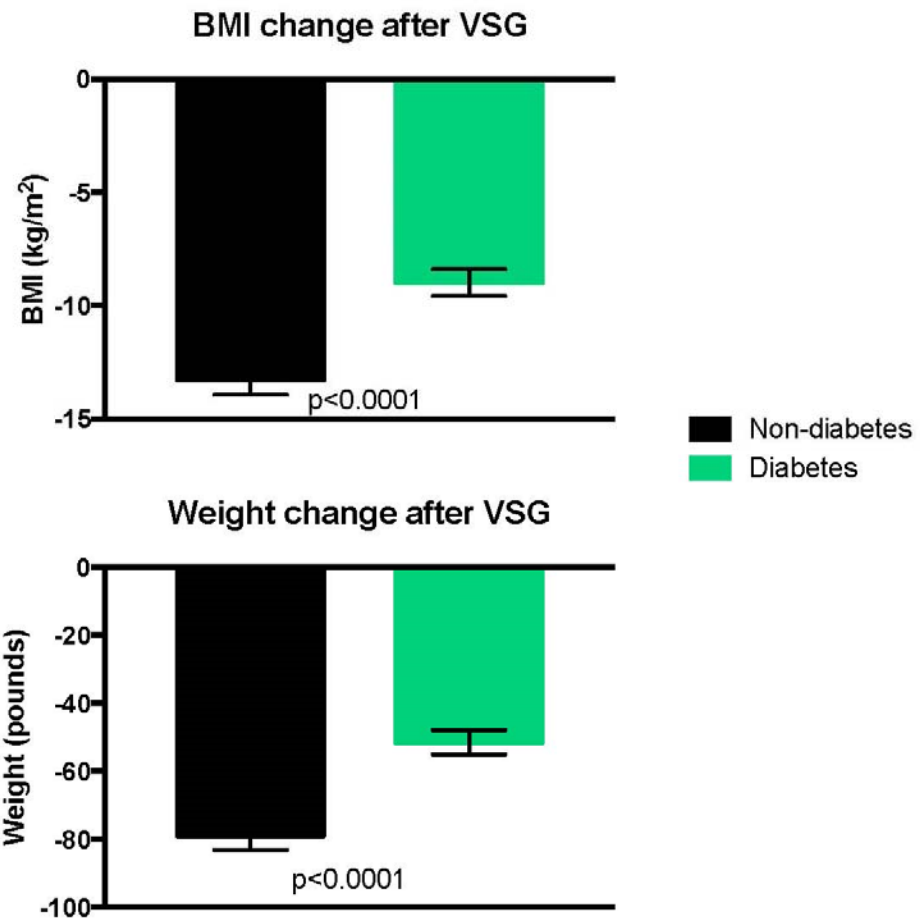


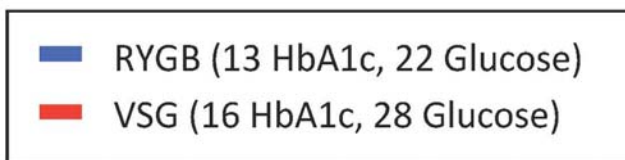
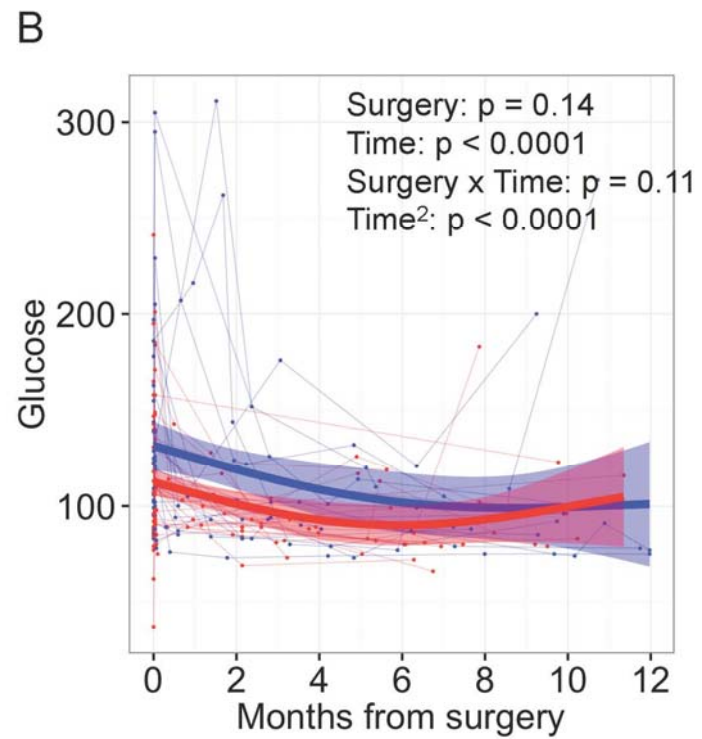
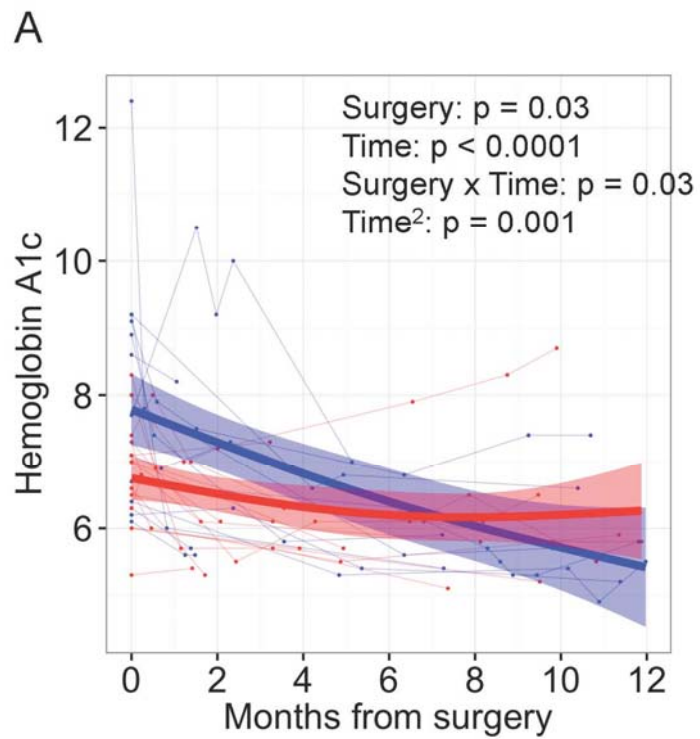
Diabetes x Surgery x Time: $p=0.005$

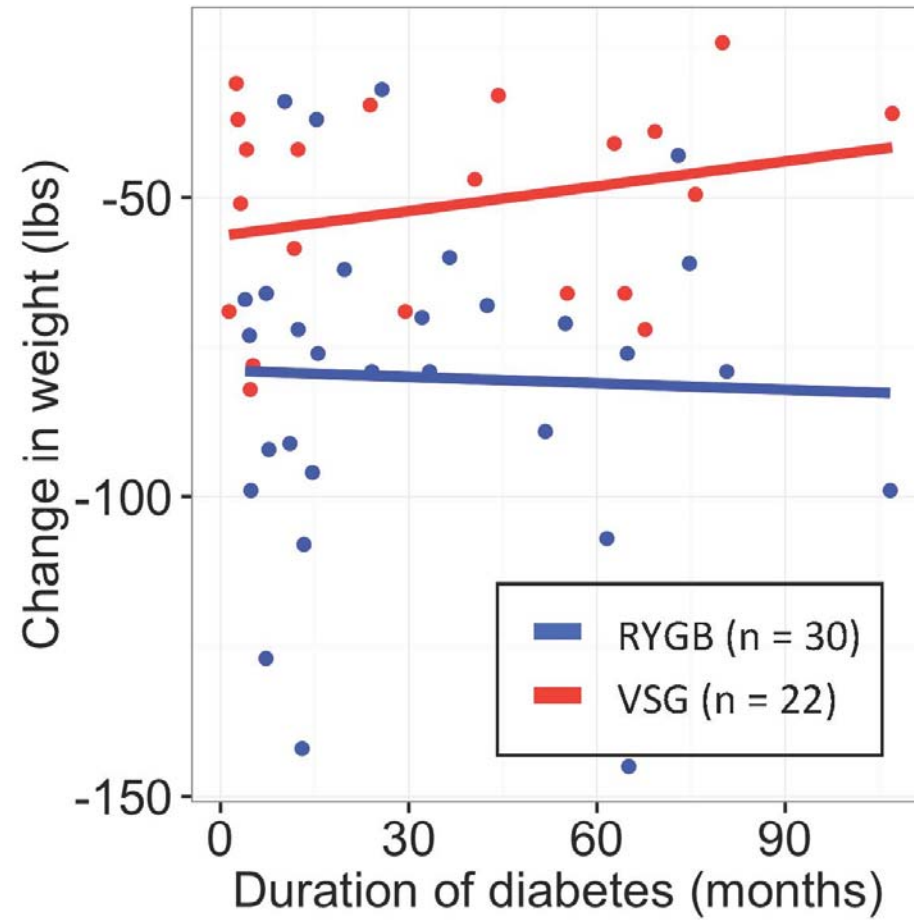


RYGB

VSG







Conclusions

- Patients with type 2 diabetes who underwent VSG lost on average 12 kilograms less, or a 34% lower weight change, than their non-diabetic counterparts ($p < 0.0001$)
- There was no relationship between a diagnosis of type 2 diabetes and the rate of weight loss in patients who underwent RYGB ($p > 0.05$).
- Although RYGB patients had higher hemoglobin A1c at baseline, they showed a significant hemoglobin A1c decrease of almost 2.5 points over 12 months compared to a decrease of only 0.5 in hemoglobin A1c, observed in VSG patients ($p = 0.03$)

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