MICRO LABS LIMITED

Diabetes Update

Vol. 2 | Issue 27 | 2021

Dear Doctor,

Greetings from Micro Labs Limited. We are happy to bring you "DIABETES UPDATE" which contains latest and interesting news in the field of Diabetes and Endocrinology.

- Obesity and COVID-19 in Adult Patients With Diabetes
- Sotagliflozin in Patients with Diabetes and Recent Worsening Heart Failure
- Factors determining chance of type 2 diabetes remission after Roux-en-Y gastric bypass surgery

Obesity and COVID-19 in Adult Patients With Diabetes

The ongoing coronavirus disease 2019 (COVID-19) pandemic first emerged in Wuhan, China in December 2020 and has infected >113 million people in >200 countries.

Obesity has caused wide concerns due to its high prevalence in patients with severe coronavirus disease 2019 (COVID-19).

MICRO LABS LIMITED

Diabetes Update

Vol. 2 | Issue 27 | 2021

Coexistence of diabetes and obesity could cause an even higher risk of severe outcomes due to immunity dysfunction. This was a retrospective study in 1,637 adult patients who were admitted into an acute hospital in Wuhan, China. Propensity score–matched logistic regression was used to estimate the risks of severe pneumonia and requiring in-hospital oxygen therapy associated with obesity. After adjustment for age, sex, and comorbidities, obesity was significantly associated with higher odds of severe pneumonia (odds ratio [OR] 1.47 [95% CI 1.15–1.88]; P = 0.002) and oxygen therapy (OR 1.40 [95% CI 1.10–1.79]; P = 0.007).

Higher ORs of severe pneumonia due to obesity were observed in men, older adults, and those with diabetes. Among patients with diabetes, overweight increased the odds of requiring in-hospital oxygen therapy by 0.68 times (P = 0.014) and obesity increased the odds by 1.06 times (P = 0.028). A linear dose-response curve between BMI and severe outcomes was observed in all patients, whereas a U-shaped curve was observed in those with diabetes. The findings provide important evidence to support obesity as an independent risk factor for severe outcomes of COVID-19 infection in the early phase of the ongoing pandemic.

Patients with COVID-19 with obesity require more medical attention and active management, especially in the elderly, men, and people with diabetes.

MICRO LABS LIMITED

Diabetes Update

Vol. 2 | Issue 27 | 2021

Clinical characteristics and outcomes of patients with COVID-19 by BMI groups

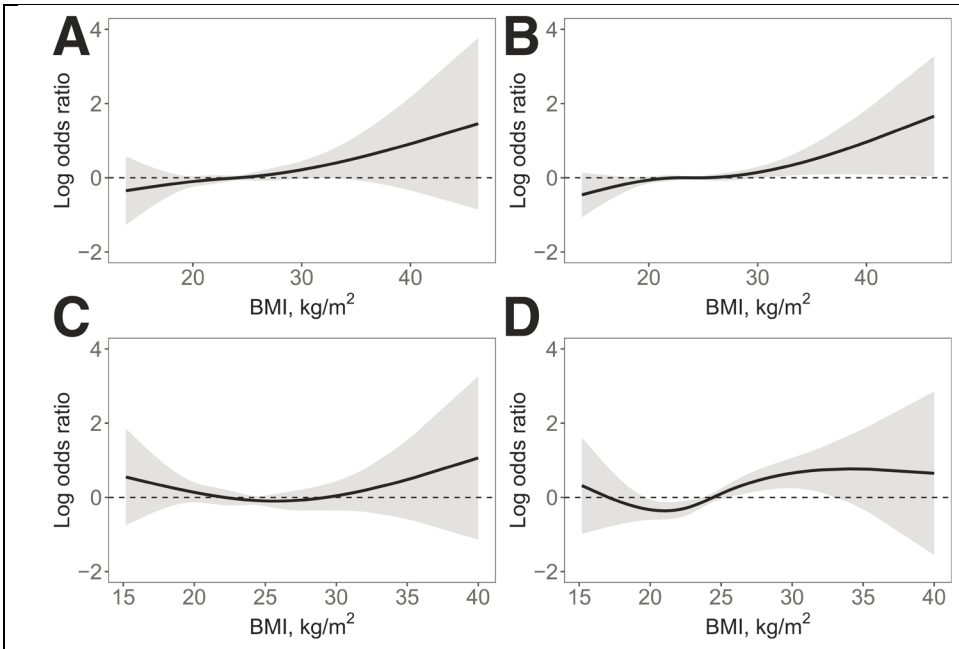
Characteristic	BMI groups^ Normal (*n* = 845)	Underweight (*n* = 75)	Overweight (*n* = 572)	Obesity (*n* = 145)	*P*#
COVID-19 severity, *n* (%)					0.577
Mild	7 (0.8)	2 (2.7)	4 (0.7)	1 (0.7)	
Moderate	581 (68.8)	48 (64.0)	385 (67.3)	91 (62.8)	
Severe	243 (28.8)	25 (33.3)	176 (30.8)	50 (34.5)	
Critical	14 (1.7)	0 (0.0)	7 (1.2)	3 (2.1)	
Outcomes					
Death	3 (0.4)	1 (1.3)	2 (0.3)	2 (1.4)	0.261
Discharge	764 (90.4)	68 (90.7)	509 (89.0)	133 (91.7)	0.721
Transfer	1 (0.1)	2 (2.7)	1 (0.2)	0 (0.0)	<0.001
Length of hospital stays, median (IQR)	12.00 (7.00, 19.00)	11.00 (7.00, 16.50)	12.00 (7.00, 17.00)	11.00 (7.00, 18.50)	0.548
ICU admission	20 (2.4)	3 (4.0)	15 (2.6)	4 (2.8)	0.854
Length of ICU stay, median (IQR)	9.00 (8.00, 14.25)	3.00 (2.00, 5.00)	5.00 (3.00, 9.00)	6.00 (3.50, 9.00)	0.039
Days from first admission to death, median (IQR)	19.00 (18.00, 34.00)	12.00 (12.00, 12.00)	20.50 (13.75, 27.25)	9.00 (6.00, 12.00)	0.335
Oxygen therapy	209 (24.7)	17 (22.7)	134 (23.4)	44 (30.3)	0.369
High-flow nasal cannula oxygen therapy	200 (23.7)	15 (20.0)	128 (22.4)	42 (29.0)	0.343
Noninvasive mechanical ventilation	21 (2.5)	0 (0.0)	17 (3.0)	5 (3.4)	0.434
Invasive mechanical ventilation	16 (1.9)	3 (4.0)	9 (1.6)	4 (2.8)	0.462
Endotracheal intubation	9 (1.1)	2 (2.7)	5 (0.9)	3 (2.1)	0.391
ECMO	2 (0.2)	0 (0.0)	1 (0.2)	0 (0.0)	0.910
Renal replacement therapy	1 (0.1)	1 (1.3)	0 (0.0)	0 (0.0)	0.019
Complications, *n* (%)					
Sepsis	1 (0.1)	0 (0.0)	0 (0.0)	1 (0.7)	0.202
Respiratory failure	6 (0.7)	0 (0.0)	7 (1.2)	1 (0.7)	0.611
Heart failure	8 (0.9)	1 (1.3)	7 (1.2)	0 (0.0)	0.594
Septic shock	42 (5.0)	9 (12.0)	23 (4.0)	10 (6.9)	0.021
Coagulopathy	5 (0.6)	2 (2.7)	2 (0.3)	0 (0.0)	0.060
Acute cardiac injury	4 (0.5)	0 (0.0)	3 (0.5)	0 (0.0)	0.774
Acute kidney injury	1 (0.1)	1 (1.3)	1 (0.2)	0 (0.0)	0.117
Secondary infection	22 (2.6)	8 (10.7)	12 (2.1)	6 (4.1)	<0.001
Hypoproteinemia	23 (2.7)	9 (12.0)	16 (2.8)	5 (3.4)	<0.001
Acidosis	7 (0.8)	0 (0.0)	3 (0.5)	2 (1.4)	0.608
Medication, *n* (%)					
Antiviral	376 (44.5)	35 (46.7)	251 (43.9)	65 (44.8)	0.972
Chloroquine	43 (5.1)	4 (5.3)	29 (5.1)	3 (2.1)	0.450
Oseltamivir	83 (9.8)	4 (5.3)	51 (8.9)	13 (9.0)	0.616
Arbidol	347 (41.1)	32 (42.7)	236 (41.3)	63 (43.4)	0.952
Ribavirin	15 (1.8)	1 (1.3)	13 (2.3)	4 (2.8)	0.796
Two of the above	68 (8.0)	4 (5.3)	43 (7.5)	12 (8.3)	0.846
Corticosteroids	98 (11.6)	12 (16.0)	68 (11.9)	19 (13.1)	0.697
Intravenous Ig	198 (23.4)	31 (41.3)	108 (18.9)	31 (21.4)	<0.001
IL-6 inhibitors	26 (3.1)	2 (2.7)	12 (2.1)	3 (2.1)	0.689
Convalescence serum	59 (7.0)	4 (5.3)	47 (8.2)	11 (7.6)	0.742
Chinese medicine (any)	618 (73.1)	55 (73.3)	406 (71.0)	93 (64.1)	0.160

IQR, interquartile range. ^BMI categories: underweight, BMI <18.5 kg/m^2; normal weight, 18.5–23.9 kg/m^2; overweight, 24.0–27.9 kg/m^2; and obesity, ≥28 kg/m^2. #*P* value was calculated from Kruskal-Wallis test for nonnormally distributed continuous variables or from χ^2 test or Fisher exact test for categorical variables.

MICRO LABS LIMITED

Diabetes Update

Vol. 2 | Issue 27 | 2021



Dose-response relationships of BMI with severe outcomes of COVID-19 in all patients and the subgroup with diabetes.

A: Association of BMI with severe pneumonia in all patients. B: Association of BMI with oxygen therapy in all patients. C: Association of BMI with severe pneumonia in patients with diabetes. D: Association of BMI with oxygen therapy in patients with diabetes

In summary, the study provides important evidence to support obesity as an independent risk factor for severe COVID-19 infection. Patients with COVID-19 with obesity require more medical attention and active management, especially in the elderly, men, and people with diabetes. The risks of severe outcomes associated with underweight in patients with diabetes require further investigations.

Source: Cao P et al. Diabetes. 2021 May;70(5):1061-1069. doi: 10.2337/db20-0671

MICRO LABS LIMITED

Diabetes Update

Vol. 2 | Issue 27 | 2021

Sotagliflozin in Patients with Diabetes and Recent Worsening Heart Failure

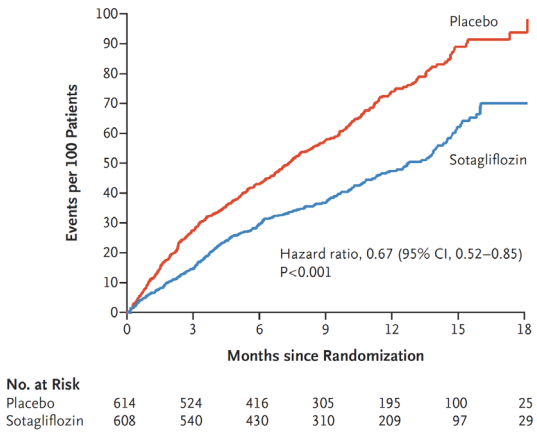
Sodium–glucose cotransporter 2 (SGLT2) inhibitors reduce the risk of hospitalization for heart failure or death from cardiovascular causes among patients with stable heart failure. However, the safety and efficacy of SGLT2 inhibitors when initiated soon after an episode of decompensated heart failure are unknown.

Effect of Sotagliflozin on Cardiovascular Events in Patients with Type 2 Diabetes Post Worsening Heart Failure (SOLOIST-WHF) trial was a multicenter, double-blind trial in which patients with type 2 diabetes mellitus who were recently hospitalized for worsening heart failure were randomly assigned to receive sotagliflozin or placebo. The primary end point was the total number of deaths from cardiovascular causes and hospitalizations and urgent visits for heart failure (first and subsequent events). The trial ended early because of loss of funding from the sponsor.

In patients with diabetes and recent worsening heart failure, sotagliflozin therapy, initiated before or shortly after discharge, resulted in a significantly lower total number of deaths from CV causes and hospitalizations and urgent visits for heart failure

A total of 1222 patients underwent randomization (608 to the sotagliflozin group and 614 to the placebo group) and were followed for a median of 9.0 months; the first dose of sotagliflozin or placebo was administered before discharge in 48.8% and a median of 2 days after discharge in 51.2%. Among these patients, 600 primary end-point events occurred (245 in the sotagliflozin group and 355 in the placebo group). The rate (the number of events per 100 patient-years) of primary end-point events was lower in the sotagliflozin group than in the placebo group (51.0 vs. 76.3; hazard ratio, 0.67; 95% confidence

interval [CI], 0.52 to 0.85; P<0.001). The rate of death from cardiovascular causes was 10.6 in the sotagliflozin group and 12.5 in the placebo group (hazard ratio, 0.84; 95% CI, 0.58 to 1.22); the rate of death from any cause was 13.5 in the sotagliflozin group and 16.3 in the placebo group (hazard ratio, 0.82; 95% CI, 0.59 to 1.14). Diarrhea was more common with sotagliflozin than with placebo (6.1% vs. 3.4%), as was severe hypoglycemia (1.5% vs. 0.3%). The percentage of patients with hypotension was similar in the sotagliflozin group and the placebo group (6.0% and 4.6%, respectively), as was the percentage with acute kidney injury (4.1% and 4.4%, respectively). The benefits of sotagliflozin were consistent in the prespecified subgroups of patients stratified according to the timing of the first dose. In patients with diabetes and recent worsening heart failure, sotagliflozin therapy, initiated before or shortly after discharge, resulted in a significantly lower total number of deaths from cardiovascular causes and hospitalizations and urgent visits for heart failure than placebo.

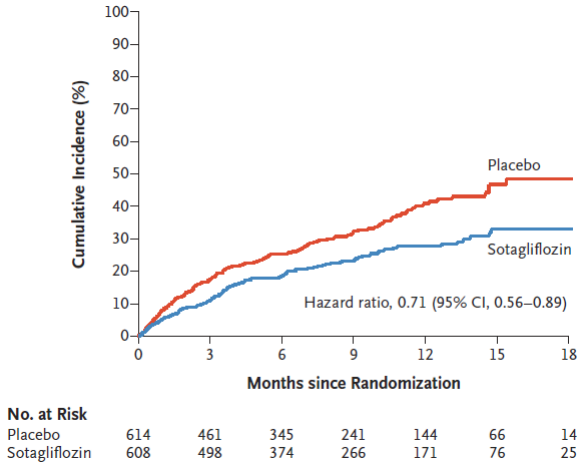


Primary Efficacy End-Point Events.

MICRO LABS LIMITED

Diabetes Update

Vol. 2 | Issue 27 | 2021



First Occurrence of Either Death from Cardiovascular Causes or Hospitalization for Heart Failure

Source: Bhatt DL et al. N Engl J Med. 2021 May;384(2):117-128.

Factors determining chance of type 2 diabetes remission after Roux-en-Y gastric bypass surgery

Type 2 diabetes is a significant health burden. Bariatric and metabolic surgery is an effective treatment option for type 2 diabetes (T2D). Increased knowledge regarding factors associated with diabetes remission is essential in individual decision making and could guide postoperative care. Therefore, we aimed to explore factors known to affect the chance of achieving diabetes remission after bariatric and metabolic surgery and to further investigate the impact of socioeconomic factors. In this nationwide study, we assessed all patients with T2D who underwent Roux-en-Y gastric bypass (RYGB) surgery between 2007 and 2015 in the Scandinavian Obesity Surgery Registry. Remission was defined as absence of antidiabetic medication for

T2D 2 years after surgery. Multivariable logistic regression was used to evaluate factors associated with diabetes remission, with missing data handled by multiple imputations.

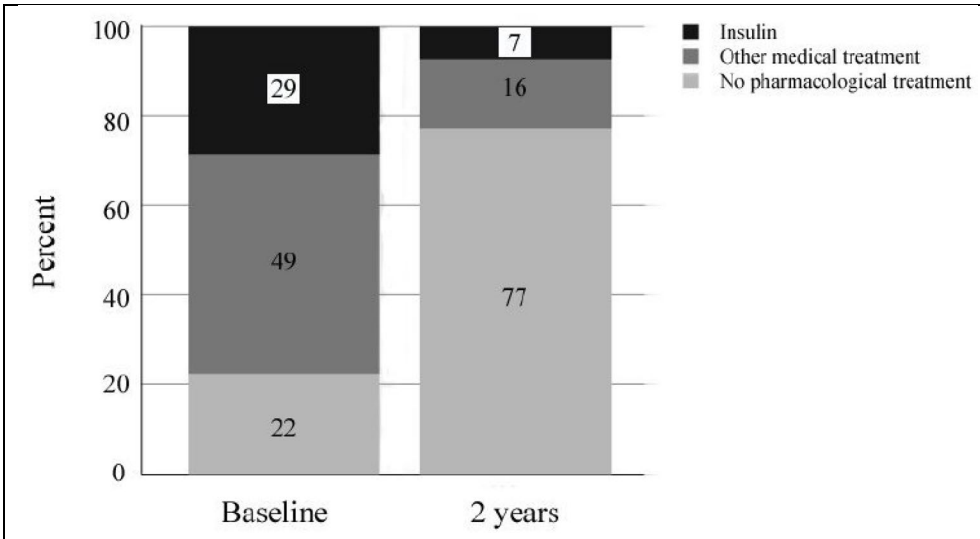
A total of 8057 patients were included. Mean age±SD was 47.4±10.1 years, mean body mass index 42.2±5.7 kg/m^2, mean hemoglobin A1c 59.0±17.33, and 61.7% (n=4970) were women. Two years after surgery, 6211 (77.1%) patients achieved T2D remission. Preoperative insulin treatment (OR 0.26, 95% CI 0.22 to 0.30), first-generation immigrant (OR 0.66, 95% CI 0.57 to 0.77), duration of T2D (OR 0.89, 95% CI 0.88 to 0.90), dyslipidemia (OR 0.71, 95% CI 0.62 to 0.81), age (OR 0.97, 95% CI 0.96 to 0.97), and high glycosylated hemoglobin A1c (HbA1c) (OR 0.99, 95% CI 0.98 to 0.99) were all associated with lower T2D remission rate. In contrast, residence in a medium-sized (OR 1.39, 95% CI 1.20 to 1.61) or small (OR 1.46, 95% CI 1.25 to 1.71) town and percentage of total weight loss (OR 1.04, 95% CI 1.03 to 1.04) were associated with higher remission rates. Among patients with T2D undergoing RYGB surgery, increasing age, HbA1c, and diabetes duration decreased the chance of reaching diabetes remission without cut-offs, while postoperative weight loss demonstrated a positive linear association. In addition, being a first-generation immigrant and living in a large city were socioeconomic factors having a negative association.

Among patients with T2D undergoing gastric bypass surgery, the overall remission rate, defined as being off medication, was 77%.

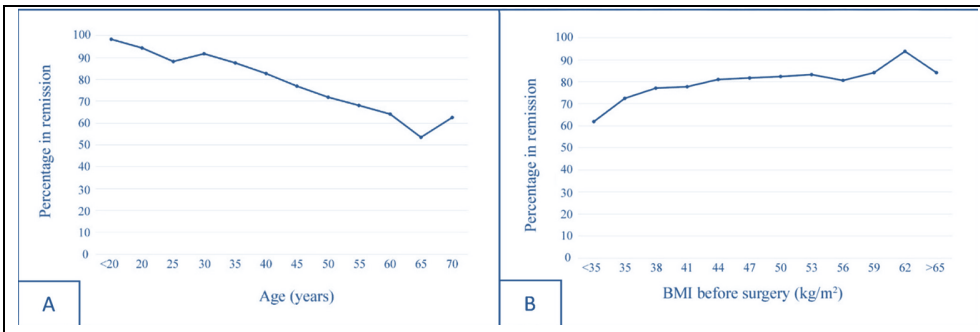
MICRO LABS LIMITED

Diabetes Update

Vol. 2 | Issue 27 | 2021



Use of antidiabetic drugs before and at 2 years after surgery. Percentage of all patients (N=8057) at each point.



Association between continuous variables and cessation of treatment for T2D. Shown are age (A; Spearman coefficient −0.21, p<0.0001), BMI before surgery (B; Spearman coefficient 0.11, p<0.001),

Among patients with T2D undergoing gastric bypass surgery, the overall remission rate, defined as being off medication, was 77%. Factors known to be associated with a lower remission rate, such as duration of diabetes, older age, and severity of metabolic impairment, had a linear inverse relationship with remission of T2D. Some socioeconomic factors were also associated with a lower chance of achieving T2D remission in this study: first-generation immigrants and living in a large city. Large postoperative weight loss was associated with a better chance of remission.

Source: Stenberg E et al. BMJ Open Diabetes Res Care. 2021 May;9(1):e002033