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ORIGINAL ARTICLE

Evolution of type 2 diabetes and carbohydrate intolerance following bariatric surgery in a Mexican mestizo population[☆]

Eva Ramírez-Avilés, Omar Espinosa-González, Mónica Amado-Galván,
Hernán Maydón-González, Elisa Sepúlveda-Guerrero, Carlos Zerrweck-López*

Clínica Integral de Cirugía para la Obesidad y Enfermedades Metabólicas del Hospital General Tláhuac, Secretaría de Salud del Distrito Federal, Ciudad de México, Mexico

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KEYWORDS

Type 2 diabetes mellitus;
Carbohydrate intolerance;
Bariatric surgery;
Gastric bypass;
Sleeve gastrectomy;
Remission

Abstract

Background: Bariatric surgery continues to be the best treatment for weight loss and control of obesity related comorbidities. Gastric bypass and sleeve gastrectomy have demonstrated to be the most effective surgeries, but this has not been established in a Mexican (non-American) population.

Objective: To analyse the improvement in type 2 diabetes mellitus and carbohydrate intolerance in obese patients after bariatric surgery.

Material and methods: A retrospective analysis was performed on the data collected prospectively between 2013 and 2015 on every obese patient with diabetes and carbohydrate intolerance submitted for bariatric surgery. Analysis was performed at baseline, and at 1, 3, 6, 9 and 12 months, and included metabolic, clinical, lipid, and anthropometrical parameters. A peri-operative and morbidity and mortality analysis was also performed. Remission rates for patients with diabetes were also established.

Results: The analysis included 73 patients, 46 with diabetes and 27 with carbohydrate intolerance. Sixty-two patients were female with a mean age of 42 years. Baseline glucose and glycosylated haemoglobin were 123 ± 34 mg/dl and $6.8 \pm 1.6\%$, and at 12 months they were 90.1 ± 8 mg/dl and $5.4 \pm 0.3\%$, respectively. Diabetes remission was observed in 68.7% of patients,

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* Corresponding author at: Clínica Integral de Cirugía para la Obesidad y Enfermedades Metabólicas, Hospital General Tláhuac, Avenida La Turba No. 655, Col. Villa Centroamericana y del Caribe, Del. Tláhuac, C.P. 13278 Ciudad de México, Mexico. Tel.: +52 55 5850 1067.

E-mail address: zerrweck@yahoo.com (C. Zerrweck-López).

PALABRAS CLAVE

Diabetes mellitus tipo 2;
Intolerancia a los carbohidratos;
Cirugía bariátrica;
Bypass gástrico;
Manga gástrica;
Remisión

including 9.3% with partial remission and 21.8% with an improvement. There was also a significant improvement in all metabolic and non-metabolic parameters.

Conclusions: Bariatric surgery safely improves the metabolic status of patients with diabetes mellitus or carbohydrate intolerance during the first year, inducing high rates of complete remission. It has also shown a significant improvement on blood pressure, lipid, and anthropometric parameters during the first year of follow-up.

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Evolución de los pacientes con diabetes mellitus tipo 2 e intolerancia a los carbohidratos posterior a cirugía bariátrica en la población mexicana

Resumen

Antecedentes: La cirugía bariátrica es el mejor método para la pérdida de peso y control de comorbilidades asociadas a la obesidad. El *bypass* y la manga gástrica han demostrado la mayor efectividad; sin embargo, no existen estudios de alto impacto en la población mexicana.

Objetivo: Analizar la mejora de la diabetes mellitus 2 y la intolerancia a los carbohidratos en pacientes con obesidad sometidos a cirugía bariátrica.

Material y métodos: Estudio retrospectivo en el que se analizaron los expedientes de pacientes con diabetes e intolerancia a los carbohidratos asociados a obesidad y que fueron sometidos a cirugía entre 2013-2015. Se realizó un análisis (0, 1, 3, 6, 9 y 12 meses) de los parámetros metabólicos, clínicos, lipídicos y de peso, así como un análisis perioperatorio y de morbimortalidad. Se establecieron cifras de remisión de diabetes.

Resultados: Se analizaron 73 pacientes (46 con diabetes y 27 con intolerancia a los carbohidratos). Sesenta y dos fueron mujeres, con un promedio de edad de 42 años. La glucosa y hemoglobina glucosilada iniciales fueron de 123 ± 34 mg/dl y de $6.8\pm 1.6\%$, y a los 12 meses de 90.1 ± 8 mg/dl y de $5.4\pm 0.3\%$, respectivamente. El 68.7% de los pacientes presentó una remisión completa, el 9.3% una remisión parcial y el 21.8% una mejoría de la diabetes. Durante todo el seguimiento mejoraron significativamente todos los parámetros metabólicos y no metabólicos.

Conclusiones: La cirugía bariátrica mejora eficazmente el estado metabólico de los pacientes con diabetes o con intolerancia a los carbohidratos en el transcurso del primer año, lo que induce a altas tasas de remisión completa. La cirugía incide en una mejoría de la presión arterial, los parámetros lipídicos y los antropométricos.

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Background

The prevalence of obesity and overweight has increased progressively and alarmingly in the worldwide population, and constitutes a serious national health problem. The relationship between obesity and type 2 diabetes mellitus is well known and affects between 50% and 65% of the worldwide population, with a projected annual increase of 1.5%–2% in Latin American countries.^{1,2} In Mexico overweight and obesity has been increasing to such an extent that in 2012 it was reported that both conditions affected 71.2% of the population. The prevalence of type 2 diabetes mellitus has increased similarly and continues to rise. It rose from 5.8% in 2000 to 9.4% in 2012.³

Treatment of type 2 diabetes mellitus consists of blood sugar goals, *i.e.* the patient would have to obtain a glycosylated haemoglobin value under 7% or of 6.5%, depending on different authors' interpretations.^{1,2} Current

guidelines established by different national and international associations are based on healthcare management and changes in lifestyle, with acknowledgement in recent years of bariatric surgery as a therapeutic option.⁴ Several studies (randomised, observational, meta-analysis and systematic reviews)^{5–9} have demonstrated that the gastric bypass and laparoscopic sleeve gastrectomy procedures significantly improve glycaemic control and reduce cardiovascular risks by a greater margin than medical care treatment.^{6,10}

It has also been reported that the prevalence of type 2 diabetes mellitus after bariatric surgery remains stable for a period of 8 years (10.7% initial and 10.5% final) in contrast to an increase in prevalence during the same period for patients receiving medical care management (7.8% initial and 24.9% final).¹¹ The impact of this type of surgery in the Mexican population has not been reported, since it has only been reported for Hispano American population.

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