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Bariatric surgery: effective method for the treatment of obesity and comorbidities

La cirugía bariátrica: método efectivo para el tratamiento de la obesidad y sus comorbilidades

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ABSTRACT

Introduction: obesity is a nutritional disease and considered a global pandemic whose prevalence is increasingly increasing. Bariatric surgery procedures represent the most effective treatment, achieving improvement in comorbidities.

Objective: explain the effectiveness of bariatric surgery as a method for the treatment of obesity and its comorbidities.

Methods: search and review in Spanish, English and Portuguese of information from the years 2019 to 2024 in the Google Academic search engine, in the Scielo, Pubmed and Lilacs databases and on the official website of the World Health Organization. Health and the Pan American Health Organization. A total of 80 articles were obtained to which selection criteria were applied, finding 22 bibliographies.

Development: bariatric surgery is a surgical intervention designed to produce significant weight loss. The criteria for its implementation include body mass index values and other essential factors. Bariatric procedures can be classified as restrictive, malabsorptive or mixed. Among its benefits are weight loss, the positive impact on associated comorbidities and evident effects on quality of life and psychological well-being.

Conclusions: Bariatric surgery is currently recognized as a valuable and therapeutic method for patients suffering from obesity, with the consequent improvement of associated comorbidities. Strict monitoring and lifestyle changes will allow a healthier life with fewer complications from now on.

RESUMEN

Introducción: la obesidad es una enfermedad nutricional y considerada una pandemia global cuya prevalencia cada vez más va en aumento. Los procedimientos de cirugía bariátrica representan el tratamiento más eficaz, consiguiendo mejoría de las comorbilidades.

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Objetivo: explicar la efectividad de la cirugía bariátrica como método para el tratamiento de la obesidad y sus comorbilidades.

Métodos: búsqueda y revisión en idioma español, inglés y portugués de información de los años 2019 al 2024 en el buscador Google Académico, en las bases de datos Scielo, Pubmed y Lilacs y en la página web oficial de la Organización Mundial de la Salud y la Organización Panamericana de la Salud. Se obtuvieron un total de 80 artículos a los que se les aplicaron criterios de selección, encontrándose 22 bibliografías.

Desarrollo: la cirugía bariátrica es la intervención quirúrgica diseñada para producir pérdidas importantes de peso. Los criterios para su realización incluyen los valores del índice de masa corporal y otros factores esenciales. Los procedimientos bariátricos se pueden clasificar en restrictivos, malabsortivos o mixtos. Entre sus beneficios están la pérdida de peso, el impacto positivo en las comorbilidades asociadas y efectos evidentes en la calidad de vida y bienestar psicológico.

Conclusiones: La cirugía bariátrica es reconocida en la actualidad como un método valioso y terapéutico para los pacientes que padecen de obesidad, con la consiguiente mejoría de las comorbilidades asociadas. Un seguimiento estricto y los cambios de estilos de vida permitirá en lo adelante una vida más sana y con menos complicaciones.

INTRODUCTION

The World Health Organization (WHO) defines obesity as a complex chronic disease caused by excessive fat accumulation that can be harmful to health. It can lead to an increased risk of type 2 diabetes mellitus and heart disease, can affect bone health, reproduction and increase the risk of certain types of cancer. It is diagnosed by measuring people's weight and height and calculating the body mass index (BMI): weight (kg)/height2 (m2). This index is an indirect marker of fat, and there are additional measurements, such as waist circumference, that can help diagnose it.[1]

According to the WHO, in 2022, 2.5 billion adults aged 18 years or older were overweight, of whom more than 890 million were obese. In that year, around 16% of adults aged 18 years or older worldwide were obese. The prevalence of obesity worldwide increased by more than 100% between 1990 and 2022. While only 2% of children and adolescents aged 5–19 years were obese in 1990 (31

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million youth), by 2022, 8% of children and adolescents were obese (160 million youth).[1]

The Americas has the highest prevalence of all regions in the world, with 62.5% of adults overweight or obese (64.1% of men and 60.9% of women). Looking at obesity alone, it is estimated to affect 28% of the adult population (26% of men and 31% of women). In the age group from 5 to 19 years, 33.6% of children and adolescents are affected by overweight or obesity, and 8% of children under five years of age.[2]

Díaz Sánchez et al.[3] described the current state of overweight and obesity in Cuba, studying a sample of 14,339 individuals over 15 years of age and including 1,556 children from 6 to 14 years of age. 19.9% of the population under 15 years of age was classified as obese in both residential areas (urban and rural), with greater representation in urban areas compared to rural areas (20.8%; 17.4% respectively). A higher prevalence of obesity was found in boys and girls from 6 to 9 years of age (males: 25.8%; females: 21.0%) compared to the 10 to 14 age group (males: 18.0%; females: 14.7%). Obesity in the general population was 17.7% in men and 25.0% in women.

The global and national figures are alarming and worrying. Although health organizations carry out actions to promote health and prevent diseases, some people resort to surgical interventions to eliminate excess fat from their bodies. One of these methods is bariatric surgery, which has recently been accepted by the international medical community; although during the development of this review, no bibliographies were found detailing its practice in Cuba.

This is why the objective was to explain the effectiveness of bariatric surgery as a method for the treatment of obesity and its comorbidities.

METHOD

A search and review was conducted in Spanish, English and Portuguese. Information was collected from the years 2019 to 2024 in the Google Scholar search engine, in the Scielo, Pubmed and Lilacs databases and on the official website of the World Health Organization and the Pan American Health Organization.

A total of 80 articles were obtained, to which the selection criteria were full articles, with available

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references, that referred to the general objective of the work and publications in the aforementioned languages, finding 22 bibliographies that corresponded to the same. Analysis-synthesis methods were used, which made it possible to interpret the bibliography found and organize the knowledge.

DEVELOPMENT

Concept and history of bariatric surgery

Bariatric surgery (BS) is considered the most effective treatment for morbidly obese patients, achieving a weight loss that can exceed 30% and is maintained over the long term. This percentage is much higher than that achieved with medical treatment that focuses on lifestyle changes, where a weight loss of 5 to 10% is achieved but normally with a progressive weight gain in one or two years. Pharmacological treatment for obesity achieves weight loss of between 4 and 11%. All these beneficial effects of BS lead to a decrease in mortality of almost 30% after 10 years, possibly due to a decrease in cardiovascular risk.[4]

The term derives from the Greek root -baros, which means "relating to weight". It defines the set of surgical interventions designed to produce significant weight loss, and in recent years it has become a growing, continuous and very frequent practice.[5]

The first observations date back to the 1930s, when the weight loss suffered by patients undergoing massive gastrointestinal resections due to vascular occlusion or cancer was described. In 1950, Kremen described the weight loss of individuals suffering from shortening of the digestive tract. The first publication dates back to 1954, when Kremen himself published, in the Annals of Surgery, the first case of jejuno-ileal bypass.[5,6]

Indications

The criteria for the indication of BC depend fundamentally on the level of BMI, but also on other factors.[7,8]

a) BMI criteria:

-BMI ≥ 40 kg/m2.

-BMI ≥ 35 and < 40 kg/m2 with one or more serious complications: type 2 diabetes mellitus (DM2), difficult-to-control arterial hypertension, non-alcoholic fatty liver disease, obstructive sleep apnea syndrome, knee and hip osteoarthritis, urinary incontinence, obesity with hypoventilation, idiopathic

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intracranial hypertension, gastroesophageal reflux, severe venous stasis, reduced mobility due to obesity, polycystic ovary syndrome causing infertility, steatohepatitis with suggestion of fibrosis 3-4, patients in whom weight loss is a priority (for example, reducing BMI to be included in the list for a transplant or joint prosthesis).

-BMI 30-34.9 kg/m2 where weight loss is a priority: DM2 with poor control despite intensified treatment, in non-diabetic subjects with serious complications that are not adequately controlled and lead to a significant decrease in quality of life (e.g., waiting list for hip or knee replacement, transplants). In most patients with this BMI, obesity will continue to be treated in Primary Health Care (PHC) and will be referred to the corresponding specialty to assess whether they are candidates for BC based on the underlying pathology.

b) Other factors:

-Age between 18 and 65 years. BC in patients with more extreme ages should be assessed individually and according to the experience of the center.

-Inadequate response to previous medical treatment in PHC. Before referring a patient for BC assessment, the usual treatment resources must have been exhausted.

-Good patient motivation and ability to adhere to the lifestyle changes required in the immediate postoperative period and in subsequent follow-up.

-Psychological stability.

- Absence of major contraindications: very high surgical risk, limited life expectancy due to any disease, severe cirrhosis or alcohol and/or other drug abuse.

- Absence of treatable endocrine disease as a cause of obesity.

- Commitment not to become pregnant during the year following BC.

The patient who is going to undergo the operation must have been previously evaluated by specialists (Internal Medicine, Surgery, Endocrinology, Psychology, Cardiology or another that is considered necessary), who jointly approve the BC, complying with the principles of medical ethics and pre- and postoperative conduct as with any surgery.

Mental health of patients undergoing surgery

Mental health is a state of mental well-being that allows people to cope with life's stressful moments, develop all their skills, be able to learn and work adequately and contribute to the improvement of

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their community. It is more than just the absence of mental disorders. Mental health conditions include mental disorders and psychosocial disabilities, as well as other mental states associated with a high degree of distress, functional disability or risk of self-harming behavior.[9]

The deterioration in quality of life caused by obesity is not only due to the increase in the incidence of medical pathologies, but also to the increase in mental health disorders, such as mood disorders, anxiety disorders, substance abuse, suicide, among others. In turn, patients suffering from mental illness are subject to various factors that promote obesity, including both aspects of mental illness itself, as well as those due to the increasing use of drugs in which weight gain is a frequent side effect.[10]

The journal Salud Mental[11] published an article in which its authors made an update of psychiatric disorders and their relationship with obesity, grouping them into 5 clinical entities and detailing their clinical manifestations. They found that there is a high prevalence of depressive and anxiety disorders, attention deficit hyperactivity disorder (ADHD), eating disorders (ED) and the use of substances and drugs such as cocaine, alcohol and tobacco.

Leiva et al.[12] constructed a flowchart for pre- and postoperative psychological care of adult patients undergoing bariatric surgery. This includes preoperative evaluation and preparation (evaluation interview, aspects that must be worked on in pre- and postoperative processes and psychosocial contraindications), postoperative support as a fundamental long-term tool, and the particularity of these aspects for adolescent patients with a psychological care flow chart different from the first.

Techniques and procedures

Bariatric procedures can be classified as restrictive, malabsorptive or mixed. Restrictive procedures alter the stomach exclusively, reducing its volume and generating a restriction in food intake, while malabsorptive procedures decrease the absorption of nutrients and mixed procedures combine both effects. The main techniques are the sleeve, also called vertical or “sleeve” gastrectomy and Roux-en-Y proximal gastric bypass, used in 70% of cases.[13]

Sleeve gastrectomy is indicated for significant weight loss in patients with a BMI > 50 kg/m². This technique removes 70 to 80% of the stomach near the antrum, along with the hormonal factor, reducing ghrelin levels. Bypass surgery reduces gastric capacity, similar to vertical gastrectomy, and also promotes the reduction of intestinal absorption by diverting part of the small intestine. In this

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way, a reduction of approximately 75% of the initial weight can be achieved.[13]

The European Interdisciplinary Group of Bariatric and Metabolic Surgery considers the adjustable gastric band, vertical sleeve gastrectomy, Roux-en-Y gastric bypass and biliopancreatic diversion with or without duodenal switch as standard bariatric and metabolic procedures for patients requiring weight loss and/or metabolic control. New procedures for which long-term outcome data are not yet available include laparoscopic gastric plication, omega or single-anastomosis gastric bypass (Mini-Gastric Bypass) and single-anastomosis duodeno-ileal bypass with sleeve gastrectomy (SADI-S), which is a variant of biliopancreatic diversion with duodenal switch.[14]

Benefits

Pillasagua López et al.[15] provided an updated perspective on the benefits of CB:

1. Weight loss and metabolic improvements: it leads to significant weight loss in patients, which contributes to the improvement or remission of various metabolic diseases. Weight loss is achieved through restriction of food intake, malabsorption of nutrients, or a combination of both mechanisms.

2. Impact on comorbidities associated with obesity: it has been shown to be effective in the treatment and control of multiple associated comorbidities, with a significant reduction in the need for medications to control diabetes, hypertension, and other metabolic conditions, leading to an improvement in quality of life.

3. Effects on quality of life and psychological well-being: they usually experience significant improvements in their quality of life and psychological well-being, as well as greater mobility, higher self-esteem, a reduction in depression and anxiety, and an improvement in their overall mental health.

4. Durability of results: related to patient adherence to lifestyle changes, including a healthy diet and regular physical activity in conjunction with better work performance. In addition, ongoing medical follow-up and psychological support are essential to maintain long-term results.

In Ecuador, a study was conducted to determine whether or not weight changes, metabolic benefits, and safety of bariatric surgery in the elderly, with a two-year follow-up, based on a BMI equal to or greater than 40 kg/m2, or equal to or greater than 35 kg/m2 with associated comorbidities16. The BMI decreased to 32.4 kg/m2 at one year of follow-up and to 30.3 kg/m2 at two years for those who

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completed follow-up at this time.

Regarding comorbidities, they were evaluated before surgery, and their improvement and remission at the first and second year of follow-up. DM2 was the disease with the highest improvement rates at one year (87.5%) and two years (100%), followed by dyslipidemia (60% improvement at one year and 80% at two years). This was not the case for osteoarticular disorders, which significantly reduced improvement and remission at the first year (100%; 50%) compared to the second year (25%: 0%).

Vela-Macías et al.[17] identified components for the prescription of physical exercise in post-BC surgery patients in their systematic review. They found that the most frequent mode of training was aerobic exercise, although they found a combination of aerobic and anaerobic exercises with excellent results; the average duration of each session was between 20 and 80 minutes, with a total duration of the program of 12-18 weeks and a frequency of 3 sessions/times per week. The authors of that research concluded that a correct prescription of physical exercise causes significant changes in body fat and body weight, in addition to being a complementary therapy for weight maintenance. Other benefits included a decrease in sedentary lifestyle, positive changes in cardiometabolic risk markers, improved blood glucose response, decreased resting heart rate and systolic blood pressure, improvements in muscle strength and physical functioning.

Complications

Complications after bariatric surgery can be classified as early (during the immediate postoperative period) or late (usually after 30 days postoperatively). Depending on the type of surgical procedure, early complications include hemorrhage, anastomotic leak, gastric or small bowel perforation, and deep vein thrombosis/pulmonary embolism, and the main late complications are intestinal obstruction, gallstone formation, and gastrointestinal bleeding[18].

Among the possible complications that may occur in restrictive procedures we can mention[8]:

1. Laparoscopic adjustable gastric band:

● Slippage of the band resulting in gastric prolapse occurs with cephalad prolapse of the body of the stomach or caudal movement of the band. Features of slippage include acute dysphagia, vomiting, regurgitation, and pain (epigastric, left upper quadrant, and chest). If left untreated, the incarcerated stomach pouch may be at risk of ischemia.

● Pouch enlargement is dilatation of the proximal gastric pouch with or without a change in band

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angle and without obstruction. The patient may present with poor satiety, heartburn, regurgitation, and occasional chest pain.

● Band erosion may occur early or even years after surgery. Early erosion may occur due to intraoperative injury to the stomach or microperforation that initiates a chronic inflammatory process and eventual erosion. Late erosions are thought to be the result of chronic ischemia due to an excessively tight band. Band erosion may manifest with a loss of restriction, epigastric pain, gastrointestinal bleeding, an intra-abdominal abscess, or port infection.

2. Roux-en-Y gastric bypass: Complications occur due to physiological changes and alteration of anatomy and include obstruction (gastric remnant distention, anastomotic stenosis), hemorrhage, and cholelithiasis. In addition, short bowel syndrome, dumping syndrome, and nutritional deficiencies may occur, but may not present as primary surgical emergencies.

3. Laparoscopic sleeve gastrectomy: long-term complications are related to stenosis, which may occur at the gastroesophageal junction or angular notch and manifest with dysphagia and vomiting.

Malabsorptive procedures such as biliopancreatic diversion cause weight loss primarily due to malabsorption of macronutrients (up to 25% protein and 72% fat), with concomitant malabsorption of micronutrients[19,20].

A complication that requires rapid action is infection at the surgical site, and BC is not exempt from this. An integrative review to assess the evidence on risk factors for the development of surgical site infection in bariatric surgery[21], yielded results of an infection rate between 0.4% and 7.6% in patients undergoing surgery using laparoscopy and in cases of surgery with different approaches (open, laparoscopic or robotic), infection rates ranged between 0.9% and 12%.

Toro-Vásquez et al.[22] evaluated weight reduction and resolution of comorbidities when comparing two surgical techniques: Roux-en-Y gastric bypass and gastric sleeve. When analyzing the complications presented by the patients, which the authors also classified as early and late and these in turn as major and minor, gastrointestinal bleeding was the early complication that occurred most often (3.9%) followed by ketoacidosis with only 4 cases (1.9%). In the case of late surgery (28.3% of the total), the most frequent were anemia (21.4%), de novo gastroesophageal reflux disease (12.9%)

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and Dumping Syndrome (10.4%).

Risks

CB is a major intervention and, therefore, has the same risks as other abdominal surgical interventions, with obesity being an added risk factor. However, mortality after this type of surgery is less than 1%, being even less than 0.3% in specialized centers and morbidity less than 7%.[7]

CONCLUSIONS

Bariatric surgery is now recognized as a valuable therapeutic method for patients suffering from obesity, with the consequent improvement of associated comorbidities. Strict monitoring and lifestyle changes will allow for a healthier life with fewer complications in the future.

DECLARATION OF CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

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DECLARATION OF AUTHORSHIP

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