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Impact of bariatric surgery on calcium absorption

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Summary

Obesity is a chronic metabolic disease of multifactorial etiology, with a growing global prevalence in recent years. One of the treatments used in patients with obesity is bariatric surgery, which requires adherence to scientifically supported criteria for techniques aimed at treating morbid or severe obesity and chronic diseases related to excess body fat (Saleset et al., 2020). Therefore, the objective of this study was to analyze the literature regarding nutritional care after bariatric surgery, focusing on calcium absorption. The economic impacts of obesity are substantial, with high costs associated with the treatment of its comorbidities and a loss of productivity due to related diseases and disabilities (Salminen et al., 2022). Therefore, obesity and its comorbidities represent a significant challenge to global health. However, the need for more long-term research is evident to improve the understanding of outcomes and ensure the effectiveness of procedures, particularly regarding nutrient absorption in bariatric patients. The results obtained in this review aim to elucidate the influence of bariatric surgery on calcium absorption in patients undergoing this procedure. However, it is important to remember that bariatric surgery is not a magic solution for weight loss. It is essential that patients follow a balanced diet and a healthy lifestyle.

Keywords: obesity – surgery – bariatric – vitamins

Abstract

Obesity is a chronic metabolic disease of multifactorial etiology, with a growing global prevalence in recent years. One of the treatments used in obese patients is bariatric surgery, which requires criteria to be followed for scientifically supported techniques at treating morbid or severe obesity and chronic diseases related to excess body fat (Saleset et al., 2020). Therefore, the objective of this study was to analyze the literature on nutritional care after bariatric surgery, focusing on calcium absorption.
The economic impacts of obesity are substantial, with high costs associated with treating its comorbidities and a loss of productivity due to related diseases and disabilities (Salminen et al., 2022).
Therefore, obesity and its comorbidities represent a significant challenge to global health. However, the need for further long-term research is evident to improve understanding of the outcomes and ensure the effectiveness of procedures, especially regarding nutrient absorption in bariatric patients.
The results obtained in this review aim to elucidate the influence of bariatric surgery on calcium absorption in patients undergoing this procedure. However, it is important to remember that bariatric surgery is not a magic solution for weight loss. It is essential that patients follow a balanced diet and a healthy lifestyle.
Keywords: obesity – surgery – bariatric – vitamins

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1. Introduction

Obesity is a chronic metabolic disease of multifactorial etiology, with a prevalence

The global number of cases has been growing over the past few years. In 2022, a study concluded that there were 878 cases worldwide.
Millions of adults were living with obesity, and in Portugal, that year the prevalence of obesity...
It was 22.5% in adults. Thus, it is clear that obesity is one of the main problems of
public health on a global scale.

It is defined by the World Health Organization (WHO) as a disease in which occurs
Abnormal or excessive accumulation of fat, which puts individuals' health at risk, and is therefore...
associated with an increased risk of mortality, given its connection to a higher prevalence of diseases.
chronic respiratory diseases, type 2 diabetes mellitus (DM2), cardiovascular diseases (CVD), hypertension
arterial hypertension (HTA), non-alcoholic fatty liver disease, chronic kidney disease, and various types of cancer.

One of the treatments used for patients with obesity is bariatric surgery, which requires...
criteria to be followed for scientifically supported techniques aimed at treating
morbid or severe obesity and chronic diseases related to excess body fat
(Saleset et al., 2020).

However, several medium- and long-term complications should be considered, including
They, the postoperative nutritional deficit, given the mechanism of action of the surgery. In the short term,
Patients who have undergone bariatric surgery experience significant body weight loss.
However, in addition to adipose tissue, muscle mass is also lost, which can lead to difficulties.
in protein intake during this period (Bettini et al., 2020; Andromalos et al., 2019; Toninello et al.,
2021).

Vitamin and mineral deficiencies, especially calcium, iron, zinc, and vitamin B12,
D, A, E, and K are also common, with their severity varying according to anatomy and function.
It is more prevalent in malabsorptive surgeries. Postprandial reactive hypoglycemia may occur.
and dumping syndrome. Post-surgery weight gain is noted, related to nutritional factors.
and long-term behavioral changes after bariatric surgery (Bettini, et al., 2020; Andromalos et al.,
2019; Toninello et al., 2021).

In addition to vitamin D, calcium is another nutrient involved in bone metabolism and that
Vitamin D absorption may be affected by bariatric surgery, regardless of vitamin D levels.
However, if the patient has adequate vitamin D status and calcium intake post-
Following this procedure, a sharp decline in calcium absorption is not expected within 12 months or more.
postoperative Roux-en-Y gastrectomy, showing only a marked decrease not related to
Vitamin D intake or levels in studies during the first 6 months (Ciobarca et al., 2020; Axenfeld et
al., 2022).

In the case of gastric sleeve surgery, even though it doesn't alter the gastrointestinal anatomy through bypass,

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The duodenum and proximal jejunum are the main sites of calcium absorption, and several mechanisms may be involved.
altering the absorption of this nutrient, such as vitamin D deficiency, reduced intake, hypochlorhydria.
or the use of proton pump inhibitors (Ciobarca et al., 2020; Axenfeld et al., 2022).

Therefore, the objective of the present study was to analyze the literature regarding
Nutritional care after bariatric surgery, focusing on calcium absorption.

Patients who undergo bariatric procedures have a higher risk of developing...
nutritional deficiencies, resulting from alterations in the gastrointestinal tract that impair the
Ingestion and absorption of nutrients. The guiding question of this work is: "In what way does the
Can bariatric surgery affect calcium absorption?

The economic impacts of obesity are substantial, with high associated costs.
treatment of their comorbidities and a loss of productivity due to illnesses and disabilities
related (Salminen et al., 2022).

Therefore, obesity and its comorbidities represent a significant health challenge.
global. However, the need for more long-term research is evident to improve the
understanding the results and ensuring the effectiveness of the procedures, especially with regard to
Nutrient absorption in bariatric patients. The objective is to conduct an integrative review on the
The impact of bariatric surgery on calcium absorption, in addition to conducting a survey on the surgery.
bariatric surgery, analyze the influence of pharmacokinetics and calcium, describe the influence of
pharmacodynamics and calcium.

2. Theoretical Framework / Results

Bariatric surgery is an increasingly common procedure for treating obesity.
morbid. According to the World Health Organization (WHO), more than 1 billion adults have
overweight or obese (WHO, 2020). Bariatric surgery may be an effective option for
These individuals benefit from this, as it can lead to significant weight loss and improvement in health problems.
related to obesity.

Studies have shown that bariatric surgery can reduce the risk of premature death in
up to 30% (Adams et al., 2012). Furthermore, bariatric surgery can also improve kidney function.
and reduce the risk of kidney disease (Navarro-Díaz et al., 2015). However, it is important to remember that
Bariatric surgery is not a magic solution for weight loss.

In addition, bariatric surgery can also improve kidney function and reduce the risk of
kidney diseases (Navarro-Díaz et al., 2015).

Bariatric surgery is an increasingly common procedure for treating obesity.
morbid, but it can have significant implications for the absorption of essential nutrients, including
calcium. According to a study published in the Journal of Clinical Endocrinology and Metabolism, the

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Bariatric surgery can reduce calcium absorption by up to 70% (Schweitzer et al., 2017).

This reduction in calcium absorption occurs due to a reduction in the intestinal absorption area and due to changes in intestinal pH, which affects the solubility and absorption of calcium. Furthermore, the loss of Hydrochloric acid in the stomach can reduce calcium absorption (Johnson et al., 2015). Deficiency Calcium deficiency can lead to bone problems such as osteoporosis and fractures, as well as affecting bone function. muscular and nervous.

A study published in Obesity Surgery found that calcium supplementation and Vitamin D was effective in preventing calcium deficiency after bariatric surgery (Vilarrasa et al., (2013). Therefore, it is essential that patients undergoing bariatric surgery follow a diet rich in... Calcium and supplements, if necessary. According to the guidelines of the American Society for For metabolic and bariatric surgery, patients should consume 1,200–1,500 mg of calcium per day. (American Society for Metabolic and Bariatric Surgery, 2020).

In addition, it is important to monitor patients' serum calcium levels after surgery. Bariatric surgery. A study published in the Journal of Surgical Research found that patients undergoing bariatric surgery Patients who underwent bariatric surgery showed significantly lower serum calcium levels. comparison with healthy controls (Heber et al., 2010). Regular monitoring can help to to prevent complications related to calcium deficiency.

2.1 TYPES OF SURGERY

Bariatric surgery is a surgical procedure performed to treat morbid obesity. There are several types of bariatric surgery, each with its own benefits and risks.

One of the most common types of bariatric surgery is gastric bypass. This procedure It involves creating a smaller stomach and reorganizing the small intestine to reduce the... nutrient absorption (Schweitzer et al., 2017).

Another type of bariatric surgery is sleeve gastrectomy. This procedure involves... removal of a large portion of the stomach, leaving only a narrow strip (Brethauer et al., 2015).

Gastric banding surgery is another type of procedure. This surgery involves placing an inflatable band around the upper part of the stomach to restrict food intake. (O'Brien et al., 2013).

Duodenal bypass surgery is a type of procedure that involves reorganizing the small intestine to reduce nutrient absorption (Santoro et al., 2017).

Duodenal switch surgery is a type of procedure that involves reorganizing the small intestine and stomach to reduce nutrient absorption (Buchwald et al., 2014).

In addition, there are other types of bariatric surgery, such as mini-gastric bypass surgery and sleeve gastrectomy. It is important to remember that the choice of the type of surgery

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Bariatric surgery depends on several factors, including the patient's age, weight, and overall health. According to According to a study published in the Journal of Surgical Research, gastric bypass is the most common surgical procedure. common in the USA (De Maria et al., 2015).

However, a study published in Obesity Surgery found that sleeve gastrectomy is the most effective procedure for long-term weight loss (Hutter et al., 2018).

2.2 Calcium Absorption in the Body.

Calcium absorption is a fundamental process for maintaining bone and muscle health. Calcium is the most abundant mineral in the human body, representing about 2% of body weight.

According to studies, calcium absorption occurs primarily in the small intestine. where calcium is absorbed through an active process involving vitamin D (Schweitzer et al., 2017).

Vitamin D plays a crucial role in calcium absorption, as it regulates the expression of calcium. of genes involved in intestinal calcium absorption (Bouillon et al., 2014).

Furthermore, calcium absorption is also influenced by other factors, such as age, Sex, diet, and level of physical activity (Weaver et al., 2016). Studies have shown that absorption Calcium levels decrease with age, especially after age 50 (Kalkwarf et al., 2015).

However, calcium and vitamin D supplementation may help improve absorption of Calcium absorption in the elderly is also affected (Dawson-Hughes et al., 2010). due to diseases such as chronic kidney disease and osteoporosis (Kidney Disease: Improving Global Outcomes, 2017).

3. Materials and Methods

3.1 TYPE OF RESEARCH

The research is an integrative, descriptive, and exploratory literature review, in order to To shed light on the influence of bariatric surgery on calcium absorption in postoperative patients. subjected to this procedure.

Based on Ercole, Melo and Alcoforado (2014), the integrative review is the most comprehensive. methodological approach regarding reviews, allowing the inclusion of experimental and non-experimental studies. experimental data are used for a complete understanding of the phenomenon being analyzed. It also combines data from... theoretical and empirical literature, in addition to incorporating a wide range of purposes: definition of concepts, Review of theories and evidence, and analysis of methodological problems of a particular topic.

According to Malhotra et al., (2005), descriptive research is a type of research that... It is responsible for observing, recording, and analyzing facts. Its objective is to describe functions or characteristics. It is characterized by the formulation of specific hypotheses.

Year V, v.2 2025 | Submission: 11/15/2025 | Accepted: 11/17/2025 | Publication: 11/19/2025

Regarding the objectives, it is based on exploratory research which aims to...
to provide more information about the subject you will be investigating, enabling its definition and its outlining, that is, facilitating the delimitation of the research topic; guiding the setting of objectives and the formulation of hypotheses or discovering a new type of approach to the subject (PRODANOV; FREITAS, 2013).

3.2 SEARCH METHODS

In order to achieve the proposed objectives, readings were and will be carried out and Summarizing various publications such as books, theses, articles, and periodicals, using databases of data from the Virtual Health Library (VHL) which includes the Scientific Electronic Library database Online (SciELO) and Latin American and Caribbean Literature in Health Sciences (LILACS), in addition In addition, searches will be conducted on PubMed.

3.3 Inclusion and Exclusion Criteria

As inclusion criteria, articles must be available in full text format.
free of charge; published between 2015 and 2024; and in Portuguese.
Studies in English will be excluded from the databases, as well as studies that were paid for and that are outside the established timeframe.
time frame established, in other languages, and that do not meet the research objectives.

3.4 DATA ANALYSIS METHODOLOGY

The data analysis methodology is descriptive and exploratory, embracing the study.
bibliographic. According to Marconi and Lakatos (2010), bibliographic research consists of surveying, of any bibliography already published, related to the subject, in any format, from books to articles. Its goal is to give researchers direct access to all written materials about a specific topic, to help scientists analyze their research or manipulate their information, without his personal involvement in such a matter.

Given this, the methodological approach will be holistic, bringing together the most...
Recent articles on the subject, organizing them in a more reasonable way according to the research proposal.

3.5 Ethical Aspects

This work will not need to be submitted for approval to the Ethics Committee.
In Research, according to CNS Resolution 466/2012, since it is a research whose information They will be obtained from materials already published and available in the literature, therefore there is no... intervention or direct approach to human beings. Therefore, the research will not involve risks to the subject.

4. Final Considerations

Bariatric surgery is an effective approach for the management and elimination of diseases.

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long-term metabolic and cardiovascular problems, particularly in individuals with obesity and Type 2 diabetes. The results of the surgery bring about hormonal and metabolic changes that promote They lead to better glucose control and reduce cardiovascular risk, being essential for lowering the risk of heart disease. hypertension and improved lipid levels. Research demonstrates the ability of surgery to They aim to prevent cardiovascular events and emphasize the importance of medical follow-up. Continuous improvement to maximize benefits and tailor support to the patient.

However, continuous multidisciplinary follow-up is essential to monitor and to manage potential complications and ensure the long-term success of the procedure.

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