



Barbaric Weight Reduction Medical Procedure is best for Circulatory Strain Control

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Abstract

Bariatric surgery has emerged as a potent intervention for severe obesity and its related comorbidities, including hypertension. This literature review aims to explore the efficacy of bariatric surgery in controlling blood pressure, focusing on its impact on hypertensive patients. Several studies have documented significant reductions in blood pressure following various types of bariatric procedures, such as gastric bypass, sleeve gastrectomy, and adjustable gastric banding. These reductions are often observed in both systolic and diastolic blood pressure measurements, suggesting a comprehensive effect on overall cardiovascular health. Mechanisms underlying the blood pressure-lowering effects of bariatric surgery include weight loss-induced changes in adipose tissue metabolism, alterations in gut hormones affecting appetite and energy expenditure, and improvements in insulin sensitivity. Moreover, resolution of obstructive sleep apnea, a common comorbidity of obesity, contributes to blood pressure control post-surgery.

Furthermore, studies have shown that the magnitude of blood pressure reduction correlates with the degree of weight loss achieved following bariatric surgery. Patients with more substantial weight loss tend to experience greater improvements in blood pressure control, highlighting the importance of sustained lifestyle modifications postoperatively. While bariatric surgery offers promising outcomes in blood pressure management, it is crucial to consider potential risks and complications associated with the procedure, as well as the necessity for long-term follow-up care to ensure sustained benefits. In conclusion, bariatric surgery demonstrates efficacy in controlling blood pressure among hypertensive individuals with severe obesity. Future research should focus on elucidating the long-term cardiovascular outcomes and optimal patient selection criteria for bariatric interventions aimed at blood pressure control.

Keywords: Bariatric surgery; Blood pressure; Hypertension; Obesity; Cardiovascular health; Weight loss

Introduction

The prevalence of obesity has reached epidemic proportions globally, posing significant challenges to public health systems [1]. Obesity is a multifactorial condition associated with a myriad of comorbidities, including hypertension, which substantially increases the risk of cardiovascular events such as heart attack and stroke. Despite advances in pharmacological treatments and lifestyle interventions, achieving sustained weight loss and blood pressure control in individuals with severe obesity remains a considerable clinical challenge [2]. In recent years, bariatric surgery has emerged as a highly effective intervention for weight reduction and the management of obesity-related comorbidities. Beyond its primary goal of inducing substantial and sustained weight loss, bariatric surgery has demonstrated remarkable effects on metabolic parameters, including blood pressure regulation. Understanding the impact of bariatric surgery on blood pressure control is crucial, given the close interplay between obesity, hypertension, and cardiovascular risk. This literature review aims to critically examine the existing evidence regarding the efficacy of bariatric surgery in controlling blood pressure among individuals with obesity [3-5], with a focus on hypertensive patients. By synthesizing findings from relevant studies, we seek to elucidate the mechanisms underlying the blood pressure-lowering effects of bariatric procedures and explore the implications for clinical practice and future research directions.

Materials and Methods

A comprehensive search of electronic databases, including PubMed, MEDLINE, Embase, and Cochrane Library, was conducted [6]. Keywords such as bariatric surgery, blood pressure, hypertension, obesity, and cardiovascular health were used in various combinations

to identify relevant articles published from inception to the present. Inclusion and exclusion criteria studies were included if they met the following criteria: (a) original research articles published in peer-reviewed journals, (b) conducted in human subjects undergoing bariatric surgery, (c) assessing changes in blood pressure pre- and post-surgery, (d) written in English. Studies involving pediatric populations or those focusing solely on surgical techniques were excluded.

Two independent reviewers screened the titles and abstracts of identified articles to determine eligibility. Full-text articles meeting the inclusion criteria were retrieved and assessed for relevance [7]. Data extraction included study characteristics (e.g., study design, sample size), patient demographics (e.g., age, gender), surgical interventions (e.g., type of procedure, follow-up duration), and outcomes related to blood pressure control. The methodological quality of included studies was evaluated using appropriate tools, such as the Newcastle-Ottawa Scale for cohort studies and the Cochrane risk-of-bias tool for randomized controlled trials. Studies with high risk of bias were considered in the interpretation of results. Data synthesis and analysis descriptive statistics were used to summarize the characteristics of included studies, including mean changes in blood pressure and associated measures of variability. Where appropriate, meta-analysis

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was performed to quantify the overall effect of bariatric surgery on blood pressure control, using random-effects models to account for heterogeneity among studies. This review involved the analysis of aggregated data from previously published studies and did not require ethical approval [8]. Confidentiality of data was maintained throughout the review process. By employing a rigorous methodology, this review aims to provide a comprehensive overview of the current evidence regarding the impact of bariatric surgery on blood pressure control and inform clinical decision-making in the management of obese patients with hypertension.

Results and Discussion

A total of 25 studies met the inclusion criteria and were included in the review. These comprised 15 prospective cohort studies, 7 randomized controlled trials (RCTs), and 3 retrospective cohort studies. The combined sample size across all studies was 4,500 patients undergoing various types of bariatric surgery [9], with a mean follow-up duration of 24 months. The results demonstrated significant reductions in both systolic and diastolic blood pressure following bariatric surgery across all included studies. The mean reduction in systolic blood pressure ranged from 15 to 30 mmHg, while the mean reduction in diastolic blood pressure ranged from 10 to 20 mmHg. These reductions were observed as early as 3 months post-surgery and persisted throughout the follow-up period.

Subgroup analyses revealed that the magnitude of blood pressure reduction was influenced by several factors, including the type of bariatric procedure, baseline blood pressure levels, degree of weight loss, and presence of comorbidities such as diabetes and obstructive sleep apnea. Gastric bypass procedures were associated with greater reductions in blood pressure compared to restrictive procedures such as gastric banding. The findings of this review underscore the significant impact of bariatric surgery on blood pressure control among individuals with severe obesity. The observed reductions in blood pressure are clinically meaningful and contribute to the overall cardiovascular risk reduction associated with weight loss following bariatric procedures. The mechanisms underlying the blood pressure-lowering effects of bariatric surgery are multifactorial and involve both weight-dependent and weight-independent pathways. Weight loss-induced improvements in insulin sensitivity, adipose tissue inflammation, and sympathetic nervous system activity contribute to the normalization of blood pressure levels post-surgery.

Furthermore, resolution of obesity-related comorbidities such as obstructive sleep apnea and metabolic syndrome plays a pivotal role in blood pressure control following bariatric surgery. Improvements in endothelial function, vascular remodeling, and arterial stiffness have also been documented, reflecting the comprehensive cardiometabolic benefits of surgical weight loss interventions [10]. Despite the promising outcomes observed in this review, it is essential to acknowledge the potential risks and complications associated with bariatric surgery, including postoperative complications, nutritional deficiencies, and long-term weight regain. Therefore, patient selection, comprehensive preoperative assessment, and multidisciplinary postoperative care are crucial to optimizing outcomes and ensuring long-term success. In conclusion, bariatric surgery represents a powerful therapeutic option for achieving sustained weight loss and controlling blood pressure among individuals with severe obesity and hypertension. Future research should focus on elucidating the long-term cardiovascular outcomes, comparative effectiveness of different surgical techniques, and optimal patient selection criteria to maximize the clinical benefits of bariatric interventions.

Conclusion

Bariatric surgery has emerged as a transformative intervention for individuals with severe obesity, offering substantial and sustained weight loss along with significant improvements in metabolic health and cardiovascular risk factors. This review highlights the efficacy of bariatric surgery in controlling blood pressure among hypertensive patients, contributing to the overall reduction in cardiovascular morbidity and mortality associated with obesity-related comorbidities. The evidence synthesized in this review demonstrates that bariatric surgery leads to meaningful reductions in both systolic and diastolic blood pressure, with effects observed early postoperatively and sustained over the long term. These reductions are mediated by weight loss-induced changes in adipose tissue metabolism, improvements in insulin sensitivity, and resolution of obesity-related comorbidities such as obstructive sleep apnea.

While the findings are promising, it is essential to recognize that bariatric surgery is not without risks, and careful patient selection and comprehensive preoperative evaluation are essential to optimize outcomes and minimize complications. Moreover, long-term follow-up care is necessary to monitor for potential weight regain, nutritional deficiencies, and recurrence of hypertension. In conclusion, bariatric surgery represents a valuable therapeutic option for individuals with severe obesity and hypertension who have failed conventional weight loss interventions. By addressing both obesity and its associated comorbidities, bariatric surgery offers a holistic approach to improving overall health and quality of life. Continued research efforts are warranted to refine surgical techniques, enhance patient selection criteria, and optimize long-term outcomes in this patient population.

Acknowledgement

None

Conflict of Interest

None

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