

PREOPERATIVE OBSTRUCTIVE SLEEP APNEA, KEY TO THE SUCCESS OF BARIATRIC SURGERY: AN INTEGRATIVE REVIEW

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SUMMARY

Introduction: Obstructive sleep apnea (OSA) exacerbates sleep disorders and is associated with chronic diseases. Bariatric surgery, in turn, promotes weight loss and improves OSA, reducing pressure on the airways. **Objective:** To evaluate the importance of treating obstructive sleep apnea as a preparatory step for the success of bariatric surgery in patients with severe obesity. **Method:** This study is an integrative literature review that searched for articles in the PUBMED, LILACS, and SciELO databases, using the descriptors "Morbid Obesity," "Bariatric Surgery," "Obstructive Sleep Apnea," and "Preoperative Period," associated with the boolean "AND." The method selected original, free studies from 2019 to 2024, in Portuguese or English, resulting in three articles. **Result:** The studies emphasized the treatment of OSA as essential for bariatric surgery, resulting in significant improvements in the apnea-hypopnea index (AHI) and body mass index (BMI). OSA was found in 38.2% of bariatric patients, increasing readmission and complication rates, especially in more obese patients and those over 40 years old. **Conclusion:** The treatment of OSA is crucial to prepare patients with severe obesity for bariatric surgery, improving respiratory function, reducing complications, and promoting weight loss and remission of comorbidities, which leads to a more positive prognosis.

Keywords: Morbid obesity; bariatric surgery; obstructive sleep apnea; preoperative period.

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Introduction

The study highlighted the importance of treating OSA as a preparatory step for bariatric surgery in patients with morbid obesity. In 2018, 394,432 bariatric surgeries were performed globally, of which 16,043 patients had OSA, and after two years, only 1,665 still had the disease (WELBOURN et al., 2019). Morbid obesity is a significant risk factor for comorbidities, affecting metabolic and respiratory functions, and excess fat, especially abdominal, exacerbates sleep disorders and is associated with epigenetic changes that increase the predisposition to chronic diseases. Bariatric surgery, therefore, is an effective approach to treating morbid obesity, promoting significant weight loss and improving respiratory disorders such as OSA, as weight reduction decreases pressure on the airways and can reverse epigenetic changes associated with obesity (LÁZARO et al., 2020).

Thus, this integrative literature review will aim to evaluate the importance of treating obstructive sleep apnea as a preparatory step for the success of bariatric surgery in patients with severe obesity.

Methodology

This is an integrative literature review study that conducted a search in the databases National Library of Medicine and National Institutes of Health (PUBMED), Latin American and Caribbean Literature in Health Sciences (LILACS), and Brazil Scientific Electronic Library Online (SciELO). The descriptors "Morbid Obesity," "Bariatric Surgery," "Obstructive Sleep Apnea," and "Preoperative Period," as well as their respective English terms, were used, which were associated with the boolean "AND." As an inclusion criterion, filters were also applied to select only original and free studies, published between the years 2019 and 2024, available in Portuguese or English, which resulted in 7 articles. From the SciELO database, no articles were found, while in LILACS, one article was obtained that also appeared in the PUBMED search, which led to 7 articles. After a full reading, the articles that did not align with the objective of this literature review were excluded, resulting in only three articles.

Results

The study investigated the importance of OSA treatment as a preparatory step for bariatric surgery in patients with morbid obesity. Twenty patients were included, with an average age of 44 years, an average body mass index (BMI) of 41.4 kg/m², and an average apnea-hypopnea index (AHI) of 63.2 events/hour. The evaluated groups included patients who underwent only bariatric surgery (BS) and those who underwent combined airway and bariatric surgery (CABS) (LIN et al., 2024).

After one year of follow-up, both groups showed significant improvement in AHI and BMI. In the CABS group, the reduction in AHI was significantly greater than in the BS group (65.7 vs. 31.5 events/h, $p = 0.04$). The success rate in the treatment of OSA was 90% in the CABS group and 80% in the BS group, with a cure rate of 60% and 50%, respectively. Moreover, in the CABS group, parameters such as oxygen saturation, apnea index, snoring, and heart rate improved significantly. There were also improvements in quality of life, measured by the Epworth Sleepiness Scale (18 vs. 2, $p = 0.004$) and a reduction in snoring (10 vs. 1, $p < 0.0001$). The changes in AHI correlated significantly with weight reductions in the CABS group ($r = 0.87$, $p = 0.001$), but not in the BS group (LIN et al., 2024).

This study investigated the importance of OSA treatment as an essential step for the success of bariatric surgery in patients with severe obesity. A total of 3,166 patients were analyzed, of which 83.9% were women, with an average age of 44.8 years and an average BMI of 48.4. The majority (89.7%) underwent laparoscopic Roux-en-Y gastric bypass (LRYGB), while the remainder underwent laparoscopic sleeve gastrectomy (LSG). After one year, a significant remission of various comorbidities, such as diabetes and hypertension, was observed, but OSA had a less pronounced remission, especially in patients who underwent LSG. OSA was identified in 38.2% of patients preoperatively and was associated with a higher rate of hospital

readmission in the first 90 days, proving to be a strong predictor of postoperative complications (KAPLAN et al., 2022).

In the follow-up, it was found that the type of surgery, age, and initial BMI were strongly associated with percentage weight loss (%EBWL), with LRYGB showing greater efficacy than LSG. OSA also influenced diabetes remission, as apneic patients showed lower chances of remission compared to non-apneic patients. Moreover, those with lower preoperative HbA1c levels demonstrated greater success in weight loss and diabetes remission, highlighting the importance of managing comorbidities such as OSA before surgery (KAPLAN et al., 2022).

The study evaluated 58 obese patients (56.9% with grade 3 obesity and 43.1% with non-morbid obesity) to determine the importance of OSA treatment before bariatric surgery. The majority (84.48%) of the patients were women, with an average age of 38.17 years and an average BMI of 41.37 kg/m². Polysomnography tests revealed an average apnea-hypopnea index (AHI) of 19.47 events per hour, with a significant worsening of respiratory parameters in the more obese patients, especially in the minimum oxygen saturation (MINSAT) (FERNANDES et al., 2021).

Patients with OSA showed worse results in parameters such as MINSAT and AHI, especially in the more obese and in individuals aged 40 or older. Among patients with morbid obesity, respiratory parameters such as oxygen saturation <80%, AHI, and respiratory desaturation index (RDI) were significantly worse compared to those with lesser obesity. (FERNANDES et al., 2021).

Age was also an important factor: patients over 40 years old showed a higher incidence of apnea and worse AHI, HI (hypopnea), and RDI indices compared to younger individuals. Moreover, men showed a higher prevalence of severe apnea compared to women. The analysis showed that the apneics had a lower minimum

oxygen saturation compared to the non-apneics, 77.46% vs. 90.41%, respectively (FERNANDES et al., 2021).

Conclusion

It is concluded that the treatment of OSA is essential in preparing patients with severe obesity for bariatric surgery. The combined approach, including treatment of OSA and bariatric surgery, can significantly improve respiratory function, reduce postoperative complications, and maximize the benefits of the surgery. Moreover, the proper management of OSA contributes to a better quality of life, promoting weight loss and the remission of comorbidities, resulting in a more positive overall prognosis for patients.

Bibliographic References

FERNANDES, V. *et al.* Alterações polissonográficas em pacientes obesos com indicação de cirurgia bariátrica. **Revista do Colégio Brasileiro de Cirurgiões**, v. 48, e20213030, 2021. Disponível em: <https://doi.org/10.1590/0100-6991e-20213030>Acesso em: 10 set. 2024.

KAPLAN, Uri *et al.* What patient factors influence bariatric surgery outcomes? A multiple regression analysis of Ontario Bariatric Registry data. **Canadian Journal of Surgery**, v. 65, n. 1, p. E66, 2022. Disponível em: <https://doi.org/10.1503/cjs.018319>

LÁZARO, J *et al.* García, M. (2020). Sensitivity of a sequential model based on a questionnaire (STOP-Bang vs Dixon) and nocturnal pulse oximetry for screening obstructive sleep apnea in patients with morbid obesity candidates for bariatric surgery. **Endocrinología, Diabetes y Nutrición** (English ed.), 67(8), 509-516. Disponível em: <https://doi.org/10.1016/j.endien.2020.03.004>

LIN, C. C. *et al.* Combined airway and bariatric surgery (CABS) for obstructive sleep apnea patients with morbid obesity: a comprehensive alternative preliminary study. **Journal of Clinical Medicine**, v. 11, n. 23, p. 7078, 2022. Disponível em: <https://www.ncbi.nlm.nih.gov/pmc/journals/1471/>.

WELBOURN, R. *et al.* Bariatric Surgery Worldwide: Baseline Demographic Description and One-Year Outcomes from the Fourth IFSO Global Registry Report 2018. **Obesity Surgery**, v. 29, n. 3, p. 782-795, mar. 2019. Disponível em: <https://doi.org/10.1007/s11695-018-3593-1>.