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Comparative Outcomes of GLP-1 Agonist Therapy and Bariatric Surgery Prior to Total Hip Arthroplasty

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ABSTRACT

Background:

Obesity is significantly associated with a higher risk of infection, wound healing complications, and impaired postoperative recovery in patients undergoing total hip arthroplasty (THA).¹⁻³ As a result, there is much interest in effective preoperative interventions for obese patients to improve surgical outcomes. Bariatric surgery is a commonly recommended intervention for morbidly obese individuals who are unsuccessful with traditional weight loss methods. However, its use preoperatively has shown mixed results regarding postoperative outcomes after THA.⁴⁻⁷ Glucagon-like peptide-1 (GLP-1) agonists, originally developed for the management of type 2 diabetes, have emerged as promising agents for weight reduction.⁸⁻¹¹ Their utility in the context of THA is gaining attention due to their potential to improve surgical outcomes by facilitating weight loss and enhancing metabolic health.¹²⁻¹⁴ This study compares the effectiveness of GLP-1 receptor agonists and bariatric surgery in reducing obesity-related surgical risks among THA patients.

Methods:

A retrospective cohort study was conducted using the PearlDiver orthopedic claims database to evaluate outcomes in patients undergoing primary total hip arthroplasty (THA) between 2010 and 2024. Patients with recent hip fracture were excluded. Four cohorts were defined: (1) patients prescribed GLP-1 receptor agonists (e.g., semaglutide) ≥ 3 months preoperatively, (2) patients who underwent bariatric surgery 6–18 months before surgery, (3) obese patients (BMI ≥ 35) without intervention, and (4) normal BMI controls (BMI 18.5–24.9). Outcomes included preoperative GLP-1 adherence, 90-day postoperative complications (surgical and medical), readmissions, and reoperations. Statistical analysis included chi-square tests for categorical outcomes, Kruskal-Wallis for LOS and cost, and logistic regression with propensity score matching (PSM) adjusting for age, gender, and Charlson Comorbidity Index (CCI).

Results:

A total of 1,145,971 primary total hip arthroplasty (THA) patients were divided into four cohorts: GLP-1 receptor agonist users ($n = 11,676$), bariatric surgery patients ($n = 1,071$), obese patients without intervention ($n = 502,530$), and normal BMI controls ($n = 631,292$). GLP-1 users had significantly lower odds of 90-day complications (odds ratio [OR] 0.75; 95% CI: 0.59–0.96; $p = 0.021$) and lower readmission rates ($p = 0.021$) compared to bariatric patients. Normal BMI patients had the lowest complication, readmission, and reoperation rate overall, with significantly lower odds than all other groups ($p < 0.001$). Additionally, patients in the GLP-1 and normal BMI groups incurred lower hospitalization costs. Regression analysis identified CCI as a significant predictor of complications ($p = 0.0079$), while age and gender were not.

Conclusion:

Obese patients who initiate GLP-1 agonists preoperatively have significantly lower odds of 90-day complications and lower readmission rates compared to those who underwent bariatric surgery and obese patients with no intervention prior to total hip arthroplasty. Patients in the GLP-1 group also incurred lower hospitalization costs compared to the bariatric surgery group.

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These findings suggest that GLP-1 agonists may provide a safe, cost-effective alternative to bariatric surgery for preoperative optimization with better short term outcomes and fewer complications.

Keywords: GLP-1 agonist, bariatric surgery, total hip arthroplasty

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