

# The Effect of Body Mass Index on the Efficacy of Semaglutide Use at the Time of Total Knee Arthroplasty

Jacquelyn Xu<sup>1</sup>, Matthew Charles Johnson, Gabriel Andres Lama, Matthew L Magruder

<sup>1</sup>Orthopaedic Surgery

**INTRODUCTION:** Glucagon-like peptide-1 receptor agonists (GLP-1RAs) have emerged as a useful tool for perioperative optimization in obese and morbidly obese patients undergoing total knee arthroplasty (TKA). However, the impact of BMI class on the efficacy of GLP-1RAs on postoperative outcomes remains largely underexplored. This study aims to evaluate the impact of semaglutide on medical complications, readmissions, and implant-related complications across BMI classes.

## **METHODS:**

A retrospective analysis of a national administrative claims database was performed between January 2010 to October 2022 for all patients undergoing primary TKA for osteoarthritis with an active semaglutide prescription. Patients were divided into non-obese (BMI <30 kg/m<sup>2</sup>), obese (BMI 30.0-39.9 kg/m<sup>2</sup>), and morbidly obese (BMI ≥40 kg/m<sup>2</sup>) groups. Semaglutide users were successfully propensity score matched at a 1:5 ratio to non-users, yielding non-obese (1,104 vs 5,520), obese (2,386 vs 11,930), and morbidly obese (3,105, vs 15,525). Outcomes included 90-day medical complications, 90-day readmissions, and 90-day and 2-year implant-related complications. Chi-squared and Fisher's exact tests were used to assess differences in outcomes between semaglutide users and non-users within each group. Multivariate logistic regressions determined odds ratios and 95% confidence intervals (95% CI). A significance threshold of p<0.01 was used to minimize type I bias.

## **RESULTS:**

In the non-obese group, semaglutide use was not associated with significantly superior medical and implant-related complication risk profiles. In obese patients, semaglutide users had significantly lower odds of 2-year PJI (OR 0.87; 95% CI 0.77-0.95; p=0.005), SSI (OR 0.42; 95% CI 0.15-0.76; p=0.002), and 90-day UTIs (OR 0.83; 95% CI 0.73-0.96; p=0.002). Among morbidly obese patients, semaglutide users had significantly lower odds of 2-year PJI (OR 0.63; 95% CI 0.10-0.91; p=0.003), all-cause revisions (OR 0.76; 95% CI 0.58-0.99; p=0.01), and 90-day UTIs (OR 0.35; 95% CI 0.21-0.47; p=0.001).

## **DISCUSSION AND CONCLUSION:**

Semaglutide use was associated with significantly improved postoperative outcomes following TKA, with a larger reduction in risk in the morbidly obese group than obese patients. In contrast, non-obese patients experienced minimal benefit. Our findings support a risk-stratified, BMI-based approach to perioperative semaglutide use to aid in optimizing patient selection, reducing unnecessary costs, and minimizing potential medication-related risks. Further research is needed to better understand the mechanism and role of semaglutide and GLP-1RAs in lower-risk patient populations.