Influence of Preoperative GLP-1 Use on Obese Patient Outcomes Following Revision Total Knee Arthroplasty

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INTRODUCTION: Obesity is an increasingly common comorbidity linked to higher rates of postoperative surgical and medical complications following total knee arthroplasty (TKA). Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) have, therefore, gained increasing attention in perioperative management due to their role in glycemic control and weight reduction. A recent meta-analysis found that GLP-1 RA use prior to total joint arthroplasty was associated with decreased 90-day and 2-year periprosthetic joint infection (PJI) risk. However, there is a paucity of literature regarding the potential effect of GLP-1 RA therapy on postoperative outcomes following revision TKA. Compared to primary TKA, revision surgery is associated with higher risk of postoperative complications, including PJI, hospital readmissions, and reoperations. This study aims to compare the rates of postoperative complications in obese patients with and without GLP-1 RA use prior to revision TKA with a propensity-matched analysis.

METHODS: This retrospective study included 3,472 consecutive patients who underwent revision TKA at a single tertiary institution following IRB approval. Patients with a body mass index (BMI) greater than 30 and a minimum of 2-year follow up were included. Patients were divided into two cohorts based on use of GLP-1 RAs within one year preoperatively and propensity-score matched in a 1:4 ratio based on the following covariates: age, sex, BMI, diabetes, chronic kidney disease, and osteoporosis. Outcomes included 90-day readmissions and medical complications and one- and two-year surgical complications. Differences in outcomes were analyzed using t-tests and Chi-squared analysis.

RESULTS: After propensity score matching, 88 GLP patients and 352 non-GLP revision TKA patients were identified. There was no significant difference between the cohorts in demographics or comorbidities. Patients who used GLPs prior to revision TKA had a significantly higher rate of acute kidney injury (AKI) within 90 days compared to non-users (0.9% vs 4.5%, $p = 0.032$). The two cohorts had comparable readmission (11.9% vs 9.1%, $p = 0.57$), reoperation (4.5% vs 4.3%, $p = 1$), and re-revision rates (3.4% vs 2.3%, $p = 0.10$) at 90 days. GLP and non-GLP patients also had similar one- and two-year surgical complication rates, including periprosthetic joint infection, periprosthetic fracture, and loosening.

DISCUSSION: In this propensity-matched cohort study of obese patients undergoing revision TKA, preoperative use of GLP-1 receptor agonists was not associated with significant differences in surgical outcomes, including readmission, reoperation, re-revision, or infection rates at short- and mid-term follow-up. These findings suggest that GLP-1 use does not confer a protective benefit in the context of revision arthroplasty, in contrast to several prior studies in primary TKA populations.

SIGNIFICANCE/CLINICAL RELEVANCE: Glucagon-like receptor-1 agonist use prior to revision total knee arthroplasty does not significantly impact postoperative complications in obese populations.

Complication	GLP Use (N=88)	No GLP Use (N=352)	P-Value
90 Day			
Readmission	42 (11.9%)	8 (9.1%)	0.574
Reoperation	15 (4.3%)	4 (4.5%)	1.000
Revision	8 (2.3%)	3 (3.4%)	0.466
PE	2 (0.6%)	0 (0.0%)	1.000
DVT	1 (0.3%)	2 (2.3%)	0.103
PJI	14 (4.0%)	2 (2.3%)	0.749
Surgical Site Infection	5 (1.4%)	2 (2.3%)	0.631
Sepsis	7 (2.0%)	0 (0.0%)	0.354
AKI	3 (0.9%)	4 (4.5%)	0.032
1 Year			
Reoperation	7 (8.0%)	41 (11.6%)	0.444
Revision	4 (4.5%)	29 (8.2%)	0.364
PJI	3 (3.4%)	24 (6.8%)	0.322
Periprosthetic Fracture	10 (11.4%)	33 (9.4%)	0.551
Loosening	3 (3.4%)	23 (6.5%)	0.323
2 Year			
Reoperation	13 (14.8%)	55 (15.6%)	1.000
Revision	6 (6.8%)	38 (10.8%)	0.324
PJI	3 (3.4%)	31 (8.8%)	0.117
Periprosthetic Fracture	12 (13.6%)	41 (11.6%)	0.586
Loosening	6 (6.8%)	31 (8.8%)	0.670

Table 1. Complication rates between obese GLP users and non-users following revision total knee arthroplasty.