Impact of Preoperative GLP-1 Agonist Use on Outcomes Following Unicompartmental Knee Arthroplasty

Zachary Fuller, Manjot Singh, Abhiram Dawar, Jeremiah Joseph Thomas, Alan H Daniels, Zuhdi Abdo

INTRODUCTION: While glucagon-like peptide-1 (GLP-1) receptor agonists have been widely studied in diabetes and obesity management, their impact on outcomes following unicompartmental knee arthroplasty (UKA) remains largely unexplored. This study evaluates the influence of preoperative GLP-1 agonist use on outcomes following UKA.

METHODS: A national claims database was used to identify patients undergoing primary UKA between 2010 and 2021. Patients with preoperative GLP-1 prescriptions were 1:1 propensity score matched to non-users based on age, sex, Charlson Comorbidity Index, diabetes, obesity, and tobacco use, yielding two matched cohorts of 1,138 patients (mean age 61.1 years, 53% female). Outcomes included 90-day medical complications (e.g., deep venous thrombosis, pulmonary embolism, infection, wound complications) and 2-year implant-related complications (e.g., aseptic loosening, prosthetic joint infection, mechanical failure, and revision). Categorical variables were compared using chi-square tests and continuous variables using t-tests.

RESULTS: At 90 days, GLP-1 users demonstrated significantly lower rates of deep vein thrombosis (0.4% vs. 1.4%, p = 0.013), wound complications (0.0% vs. 1.2%, p < 0.001), and surgical site infections (0.1% vs. 1.2%, p = 0.002) compared to non-users. There were no significant differences in acute kidney injury, pulmonary embolism, urinary tract infection, hematoma, transfusion, or readmission. At 2 years, GLP-1 users had significantly lower rates of prosthetic joint infection (0.4% vs. 1.4%, p = 0.013); rates of aseptic loosening, revision surgery, and other mechanical complications were lower but did not reach statistical significance (p > 0.05).

DISCUSSION AND CONCLUSION: Preoperative GLP-1 agonist use may be protective against thromboembolic, infectious complications, and wound issues following UKA, possibly due to its role in improving glycemic control, reducing systemic inflammation, and enhancing tissue repair and angiogenesis. Our findings support the safety of GLP-1 therapy in patients undergoing UKA and highlight its potential role in improving postoperative outcomes.

Table 1: Pre- and Post-Matching Patient Demographics and Comorbidities

Variable	Unmatched GLP-1 (n = 1,212)	No GLP-1 (n = 91,396)	Unmatched P-value	Matched GLP-1 (n = 1,138)	Matched No GLP-1 (n = 1,138)	Matched P-value
Age, mean (SD)	60.77 (8.87)	63.34 (9.75)	<0.001	61.10 (8.54)	61.10 (8.54)	1.000
Female sex, n (%)	647 (53.4%)	48,193 (52.7%)	0.672	601 (52.8%)	601 (52.8%)	1.000
CCI, mean (SD)	2.21 (2.14)	1.10 (1.63)	<0.001	1.95 (1.75)	1.95 (1.75)	1.000
Diabetes, n (%)	1,144 (94.4%)	27,152 (29.7%)	<0.001	1,070 (94.0%)	1,070 (94.0%)	1.000
Obesity, n (%)	432 (35.6%)	16,439 (18.0%)	<0.001	383 (33.6%)	383 (33.6%)	1.000
Tobacco use, n (%)	506 (41.7%)	35,466 (38.8%)	0.039	466 (41.0%)	466 (41.0%)	1.000

Table 2: 90-day Medical and Surgical Outcomes in GLP-1 Users vs Non-users

Complication	GLP-1 (n=1138)	No GLP-1 (n=1138)	GLP-1 Rate (%)	No GLP-1 Rate (%)	Relative Risk Reduction	P-value
AKI	11	13	0.97	1.14	0.15	0.837
DVT	4	16	0.35	1.41	0.75	0.013
PE	2	4	0.18	0.35	0.49	0.683
Wound	0	14	0.00	1.23	1.00	<0.001
SSI	1	14	0.09	1.23	0.93	0.002
Hematoma	1	6	0.09	0.53	0.83	0.130
Transfusion	0	4	0.00	0.35	1.00	0.133
UTI	27	38	2.37	3.34	0.29	0.208
Readmission	4	4	0.35	0.35	0.00	1.000

Table 3: 2-year Implant-related Outcomes in GLP-1 Users vs Non-users

Complication	GLP-1 (n=1138)	No GLP-1 (n=1138)	GLP-1 Rate (%)	No GLP-1 Rate (%)	Relative Risk Reduction	P-value
Aseptic Loosening	6	13	0.53	1.14	0.54	0.167
Instability/Dislocation	3	3	0.26	0.26	0.00	1.000
Mechanical Failure	1	7	0.09	0.62	0.85	0.077
Periprosthetic Fracture	2	1	0.18	0.09	-1.00	1.000
Periprosthetic Osteolysis	0	0	0.00	0.00	-	1.000
Prosthetic Joint Infection	4	16	0.35	1.41	0.75	0.013
Bearing Wear	1	1	0.09	0.09	0.00	1.000
All-cause Revision	26	41	2.28	3.60	0.37	0.083