Preoperative Glucagon-Like-Peptide-1 Agonists Increase 90-Day Readmissions and Medical Complications Without Affecting Two-Year Implant Complications Following Total Knee Arthroplasty

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INTRODUCTION: Glucagon-like peptide-1 (GLP-1) agonists are now widely used for the management of obesity and weight loss. Orthopedic surgeons are seeing an increased number of patients using GLP-1 agonist because of their ability to optimize preoperative weight before total knee arthroplasty (TKA). However, no single institutional study has evaluated the use of GLP-1 agonists on postoperative outcomes. This study aimed to assess the association between GLP-1 agonist usage with (1) healthcare utilization and (2) complications rates.

METHODS: This was a retrospective study of patients who underwent primary unliteral TKA at a tertiary medical center from Jan 2016 to Dec 2022 (n=14,894 patients). GLP-1 agonist use was defined as taking the drug within 1-year prior to surgery (n=233). Multivariable logistic regression was used to evaluate GLP-1 use (yes/no) and rate of 90-day readmission, 90-day emergency department (ED) visits, length-of-stay (LOS), 90-day medical complication rate, and two-year implant complication rate.

RESULTS: There was a significant increase in odds of 90-day readmission in patients taking GLP-1 agonists (OR = 1.52, p = 0.037) and a significant increased rate of 90-day medical complications (11.6% vs 6.92%, p = 0.008) (Tables 2 and 3). No significant association was found for LOS, 90-day ED visits, or two-year implant complication rates (Tables 2 and 4).

DISCUSSION AND CONCLUSION: Preoperative GLP-1 agonist use was associated with higher odds of 90-day readmission and 90-day medical complications, with no significant differences in length of stay, emergency visits, or two-year implant-related complications. These findings suggest that while GLP-1 agonists may support metabolic optimization before TKA, their use may carry increased short-term medical risk, warranting careful perioperative evaluation and monitoring.

Table 1— Cohort demographics

Variable	Level	Measure	N
Age		67.0 (61.0,73.0)	14894
Sex	F	8929 (60.0%)	14894
	M	5965 (40.0%)	
BMI		31.2 (27.3,35.8)	13101
Race	White	12898 (88.1%)	14707
	Black	1897 (13.0%)	
	Other	441 (3.10%)	
Education		14.0 (12.0,16.0)	13102
Smoking	Never	7375 (56.3%)	13103
	Quit 6m+	4373 (33.4%)	
	Quit <6m	454 (3.46%)	
	Current	903 (6.89%)	
ADI		35.0 (33.0,78.0)	14178
CCI		1.00 (0.00,2.00)	14698
Insurance	Commercial/Private	4532 (54.1%)	13364
	Medicaid/Medicare	8380 (64.3%)	
	VC/Other	212 (1.59%)	
Preop NARX Score (Risk)		110 [0.00,190]	8934
PROM/Phenotype	Pain+ PS+ MCS+	2884 (22.0%)	13098
	Pain+ PS+ MCS-	1825 (13.9%)	
	Pain+ PS- MCS+	428 (3.27%)	
	Pain+ PS- MCS-	482 (3.53%)	
	Pain- PS+ MCS+	1908 (7.70%)	
	Pain- PS+ MCS-	1125 (8.57%)	
	Pain- PS- MCS+	1824 (13.9%)	
	Pain- PS- MCS-	3544 (27.1%)	
Diabetes	No	10736 (72.1%)	14894
	Yes	4158 (27.9%)	
Insulin Use	No	10850 (72.8%)	14894
	Yes	4044 (27.2%)	
Metformin Use	No	11254 (75.6%)	14894
	Yes	3640 (24.4%)	
GLP-1 use	No	14661 (98.4%)	14894
	Yes	233 (1.56%)	

Data reported as median [IQR] or n (%). BMI: body mass index, ADI: area deprivation index, CCI: charlson comorbidity index, NARX: narcotic opioid risk score

Table 2 – Multivariable logistic regression for length of stay (LOS), 90-day ED visits, and 90-day readmissions for GLP-1 agonist users versus non-users

Factor	OR (95%CI)	p
LOS	0.93 (0.64, 1.35)	0.709
90-day ED	1.18 (0.85, 1.65)	0.325
90-day Readmissions	**1.52 (1.03, 2.24)**	**0.037**

This model was anchored on BMI and adjusted for age, sex, race, CCI, smoking, education, Narx score, insurance, PROM Phenotypes, baseline KOOS JR, diabetes, insulin, and metformin statuses.

Table 3 – Comparison between 90-day medical complication rates

Variable	Level	Total (N=14894)	GLP-1 Agonist Non-User (N=14661)	GLP-1 Agonist User (N=233)	p	N
Overall Complications	Yes	1041 (6.99%)	**1014 (6.92%)**	**27 (11.6%)**	**0.008**	14894
Subgroups						
Acute Kidney Injury	Yes	200 (1.34%)	193 (1.32%)	7 (3.00%)		
Cerebrovascular Accident	Yes	99 (0.66%)	97 (0.66%)	2 (0.86%)		
Deep Vein Thrombosis	Yes	372 (2.50%)	364 (2.48%)	8 (3.43%)		
Hypoglycemia	Yes	27 (0.18%)	24 (0.16%)	3 (1.29%)		
Myocardial Infarction	Yes	91 (0.61%)	87 (0.59%)	4 (1.72%)		
Pulmonary Embolism	Yes	144 (0.97%)	141 (0.96%)	3 (1.29%)		
Sepsis	Yes	70 (0.47%)	67 (0.46%)	3 (1.29%)		
Venous Thromboembolism	Yes	595 (3.99%)	585 (3.99%)	10 (4.29%)		

Table 4 – Comparison between 2-year implant complication rates

Variable	Level	Total (N=14894)	GLP-1 Agonist Non-User (N=14661)	GLP-1 Agonist User (N=233)	p	N
Overall Complications	Yes	575 (3.85%)	564 (3.85%)	9 (3.86%)	0.99	14894
Subgroups						
Aseptic Loosening	Yes	55 (0.37%)	55 (0.38%)	0 (0.00%)		
Periprosthetic Fracture	Yes	9 (0.06%)	9 (0.06%)	0 (0.00%)		
Prosthetic Joint Infection	Yes	290 (1.95%)	287 (1.96%)	3 (1.29%)		
Revision Surgery	Yes	390 (2.62%)	382 (2.61%)	8 (3.43%)		

This model was anchored on BMI and adjusted for age, sex, race, CCI, smoking, education, Narx score, insurance, PROM Phenotypes, baseline KOOS JR, diabetes, insulin, and metformin statuses.