

Semaglutide Use Prior to Total Hip Arthroplasty Results in Fewer Postoperative Prosthetic Joint Infections and Readmissions

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INTRODUCTION:

Diabetes (DM) and obesity are two of the most common risk factors associated with complications following total hip replacement (THA). Semaglutide is relatively new and effective medication for the management of diabetes, and has recently been shown to stimulate substantial weight loss. However, the medication's effect on THA outcomes has yet to be clarified. Thus, the aim of this study is to evaluate whether patients who are taking Semaglutide at the time of THA demonstrate: 1) fewer medical complications; 2) fewer implant related complications; 3) fewer readmissions; 4) less costs.

METHODS:

A retrospective query was performed from January 1, 2010, to October 31, 2021, using the administrative claim database. Patients who underwent primary THA for osteoarthritis who had a diagnosis of DM and an active prescription for semaglutide at the time of the procedure were included in the analysis. Patients taking semaglutide were successfully propensity score matched to controls based on age, sex, BMI, hyperosmolar hyperglycemic syndrome (HHS), tobacco use, presence of complicated diabetes diagnosis, insulin status, metformin use, and Elixhauser Comorbidity index (ECI), yielding a total of 9,465 THA patients (Semaglutide = 1,653; control = 7,812). The outcomes of interest included 90-day postoperative medical complications, 2-year implant related complications, 90-day readmissions, in-hospital length of stay, and day-of-surgery and 90-day episode of care costs. Multivariate logistical regression was used to calculate odds ratios (ORs), 95% confidence intervals, and p-values. A p-value of <0.01 was used as the significance threshold to minimize type 1 error.

RESULTS:

Patients who were taking semaglutide at time of THA did not demonstrate statically significant rates of any medical complication (Table 1). However, patients taking semaglutide had lower rates of readmission within 90 days of surgery (6.2 vs. 8.8%; OR 0.68; $P<0.01$). Rates of prosthetic joint infection were also significantly lower in the experimental group (1.6 vs. 2.9%; OR 0.56; $P<0.01$); there was no difference between groups for any other implant related complication. Finally, there was no difference between cohorts for lengths of stay, same-day surgical costs, or 90-day episode of care costs.

DISCUSSION AND CONCLUSION:

This investigation demonstrates that patients who were taking semaglutide at the time of THA demonstrated decreased 90-day readmissions and 2-year prosthetic joint infections. There was no difference for any medical complication, lengths of stay, or costs. Given its significant benefit in terms of glycemic control and weight loss, providers may consider its use prior to surgery. More research is needed to fully understand its effects on postoperative outcomes following THA.

Table 1: Comparison of 90-day medical complications, 90-day readmissions, 2-year implant related complications, length of stay and costs between semaglutide cohort and case-matched control cohort. CVA = cerebrovascular accident; DVT = deep vein thrombosis; PE = pulmonary embolism; MI = myocardial infarction; PNA = pneumonia; AKI = acute kidney injury; HGE = hypoglycemic event; SSI = surgical site infection; PJI = prosthetic joint infection; PPFx = periprosthetic fracture; ASL = aseptic loosening; LOS = lengths of stay.

Variables	Semaglutide (n = 1,653)		No Semaglutide (n = 7,812)		OR	P-Value
	n	%	n	%		
MEDICAL COMPLICATIONS						
90 CVA	0	0.0	68	0.9	0.67 (0.32-1.25)	0.2426
90 DVT	0	0.0	55	0.7	0.69 (0.30-1.38)	0.3348
90 PE	0	0.0	34	0.4	0.69 (0.24-1.62)	0.4453
90 VTE	11	0.7	70	0.9	0.74 (0.37-1.35)	0.3601
90 MI	0	0.0	55	0.7	0.72 (0.33-1.39)	0.3579
90 PNA	32	1.9	111	1.4	1.37 (0.91-2.02)	0.1185
90 AKI	46	2.8	301	3.9	0.69 (0.50-0.94)	0.0242
90 Hypoglycemic Event	0	0.0	81	1.0	0.45 (0.20-0.71)	0.0348
90 Sepsis	0	0.0	33	0.4	0.57 (0.17-1.42)	0.2821
90 SSI	17	1.0	106	1.4	0.74 (0.43-1.21)	0.2550
90 Readmission	103	6.2	689	8.8	0.68 (0.54-0.84)	0.0004
IMPLANT RELATED OUTCOMES						
2 Year PJI	27	1.6	223	2.9	0.56 (0.37-0.82)	0.0050
2 Year PPFx	0	0.0	39	0.5	1.10 (0.50-2.17)	0.7980
2 Year AS Loosening	0	0.0	0	0.0	n/a	n/a
2 Year Revision	30	1.8	216	2.8	0.64 (0.43-0.93)	0.0257
LOS						
LOS	2.7 Days		2.9 Days		0.99 (0.81-1.21)	0.9334
Average Same-day Cost	\$9,174.72		\$10,046.30			0.5169
Average 90 Cost	\$13,219.92		\$14,681.71			0.0562