Utilization of glucagon-like peptide-1 receptor agonist at the time of total hip arthroplasty for patients with morbid obesity

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INTRODUCTION:

Morbid obesity negatively affects outcomes after total hip arthroplasty (THA). The optimal strategy for weight loss prior to THA has not been identified. Recently, glucagon-like peptide-1 receptor agonists (GLP-1 RA) have been used for their ability to promote pharmacologic weight loss in the medical management of obesity. The goal of this study was to evaluate the effect of perioperative use in GLP-1 RA in patients with morbid obesity undergoing primary THA on postoperative outcomes.

METHODS:

Using an administrative claims database, patients with morbid obesity (BMI ≥40.0 kg/m^2) undergoing primary THA were identified. Patients with morbid obesity and GLP-1 RA use for 3 months before and after surgery were matched to patients with morbid obesity without GLP-1 RA use (controls) and to comparison group of patients with severe obesity (35.0-39.9 kg/m^2) in a 1:4:4 ratio based on patient age, gender, diagnosis of type II diabetes mellitus (TIIDM), and Charlson Comorbidity Index (CCI). Univariable tests were performed to compare overall group differences in 90-day and 2-year postoperative outcomes between matched cohorts, followed by post hoc pairwise testing and p-value adjustment for multiple comparisons.

RESULTS:

Patients with morbid obesity on GLP-1 RA had a significantly lower rate of 90-day periprosthetic joint infection (PJI) (1.6% vs. 3.2%; P=0.034), readmission (6.9% vs 9.7%; P=0.043), any medical complication (10.5% vs 14.1%; P=0.028), and postoperative hematoma formation (0.0% vs. 1.3%, P=0.001) compared to controls. Patients with morbid obesity on GLP-1 RA demonstrated lower rates of hematoma formation (0.0% vs 1.0%; P=0.003) compared to patients with severe obesity (BMI=35.0-39.9kg/m^2). There were no differences in other medical complications or 2-year surgical complications.

DISCUSSION AND CONCLUSION:

Perioperative use of GLP-1 RA in patients with morbid obesity reduced the risk of acute PJI and 90-day hospital readmission. The risk is reduced to a level comparable to obese patients with BMI <40.0 kg/m^2. These medications may be a viable strategy in the optimization of this challenging patient population.

Table 2. 90-Day Postoperative Outcomes

90-Day Outcomes	Severe Obesity (BMI=35-39.9) (n=3,084)	Morbid Obesity (BMI>=40) GLP-1 RA use (n=771)	Morbid Obesity (BMI>=40) GLP-1 RA non-use (n=3,084)	P-value	Posthoc Pairwise comparisons (adjusted P-value)
Readmissions	273 (8.9%)	53 (6.9%)	300 (9.7%)	**0.043**	Groups 1 vs 2 (P=0.247); Groups 1 vs 3 (P=0.762); Groups 2 vs 3 **(P=0.043)**
Any Medical Complication	416 (13.5%)	81 (10.5%)	435 (14.1%)	**0.032**	Groups 1 vs 2 (P=0.079); Groups 1 vs 3 (P=1.000); Groups 2 vs 3 **(P=0.028)**
Acute Kidney Injury (AKI)	124 (4.0%)	25 (3.2%)	134 (4.3%)	0.375	-
Cardiac Arrest	<11	<11	<11	0.829	-
Deep Vein Thrombosis (DVT)	26 (0.8%)	<11	36 (1.2%)	0.272	-
Wound Dehiscence	35 (1.8%)	18 (2.3%)	39 (2.5%)	0.345	-
Hematoma	32 (1.0%)	0 (0.0%)	39 (1.3%)	**0.008**	Groups 1 vs 2 **(P=0.003)**; Groups 1 vs 3 (P=1.000); Groups 2 vs 3 **(P=0.001)**
Nerve Injury	0 (0.0%)	0 (0.0%)	0 (0.0%)	-	-
Pneumonia (PNA)	52 (1.7%)	<11	50 (1.6%)	0.286	-
Pulmonary Embolism (PE)	<11	<11	<11	1.000	-
Transfusion	65 (2.1%)	<11	65 (2.1%)	0.078	-
Urinary Tract Infection (UTI)	139 (4.5%)	28 (3.6%)	132 (4.9%)	0.291	-
90-Day Surgical Complication	**Severe Obesity (BMI=35-39.9) (n=3,084)**	**Morbid Obesity (BMI>=40) GLP-1 RA use (n=771)**	**Morbid Obesity (BMI>=40) GLP-1 RA non-use (n=3,084)**	**P-value**	**Posthoc Pairwise comparisons (adjusted P-value)**
Component Revision	55 (1.8%)	<11	59 (1.9%)	0.092	-
Prosthetic Joint Infection	68 (2.2%)	12 (1.6%)	100 (3.2%)	**0.006**	Groups 1 vs 2 (P=0.967); Groups 1 vs 3 **(P=0.046)**; Groups 2 vs 3 **(P=0.034)**
Periprosthetic Fracture	18 (0.6%)	<11	28 (9.1%)	0.315	-
Dislocation	55 (1.8%)	12 (1.6%)	53 (1.7%)	0.909	-
Aseptic Loosening	<11	0	<11	0.062	-
Instability	<11	0	<11	0.457	-
Osteolysis	<11	0	<11	0.865	-
Wear	0 (0.0%)	0	<11	0.335	-