Impact of Semaglutide on Surgical Outcomes in Adult Knee Arthroplasty: A Propensity Matched Cohort Analysis With Six Year Follow-up

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INTRODUCTION:

Semaglutide, a medication commonly used for weight management and diabetes, may impact outcomes following knee arthroplasty in adults. This study aimed to investigate the effects of Semaglutide on post-operative complications and overall outcomes in patients undergoing knee replacement surgery

METHODS:

This retrospective cohort study utilized data from a large national database in the United States, covering the period from January 2003 to March 2023. Adult patients who underwent knee arthroplasty were dichotomized into two cohorts: those who received Semaglutide within one year prior to surgery (n = 3,221) and those who did not (n = 247,125). The cohorts were matched 1:1 on demographic variables (gender, sex, race, ethnicity, BMI) and comorbidities (diabetes, COPD, vascular and heart disease, smoking status) using a propensity score matching system. Patients were followed for 6 years.

RESULTS:

The mean age of the Semaglutide cohort was 63.17 ± 8.52 years, while the control cohort had a mean age of 64.14 ± 12.5 years ($p < 0.001$). The proportion of females in the Semaglutide cohort was 55.7% compared to 55.3% in the control cohort ($p = 0.849$), and males accounted for 44.3% and 44.7%, respectively ($p = 0.849$). Analysis of post-operative outcomes revealed that the Semaglutide cohort had a significantly lower risk of knee arthroplasty revision (RR, 0.76 [95% CI, 0.60 to 0.85]; $p < 0.001$) and prosthesis dislocation (RR, 0.81 [95% CI, 0.59 to 0.90]; $p < 0.001$). There were no significant differences in the risks of knee prosthesis infection (RR, 1.42 [95% CI, 0.66 to 3.04]; $p = 0.635$), surgical site infection (RR, 1.22 [95% CI, 0.51 to 2.90]; $p = 0.917$), mortality (RR, 1.22 [95% CI, 0.51 to 2.90]; $p = 0.917$), respiratory failure (RR, 1.42 [95% CI, 1.00 to 2.02]; $p = 0.347$), pulmonary embolism (RR, 1.09 [95% CI, 0.57 to 2.07]; $p = 0.674$), lower deep vein thrombosis (RR, 1.49 [95% CI, 0.90 to 2.44]; $p = 0.392$), Clavien-Dindo IV complications (RR, 1.24 [95% CI, 0.97 to 1.59]; $p = 0.805$), or cardiovascular diseases (RR, 1.04 [95% CI, 0.70 to 1.55]; $p = 0.409$).

DISCUSSION AND CONCLUSION: The use of Semaglutide within one year prior to knee arthroplasty was associated with decreased risks of revision surgery and prosthesis dislocation but did not significantly impact other post-operative complications such as infections, mortality, respiratory failure, or cardiovascular events. These findings suggest that while Semaglutide may affect certain surgical outcomes, further research is needed to fully understand its implications for patients undergoing knee replacement surgery.

Risk Factor	RR	Lower Bound	Upper Bound	p-value
Knee Arthroplasty Revision	0.76	0.6	0.85	< 0.001
Prosthesis Dislocation	0.81	0.59	0.9	< 0.001
Knee Prosthesis Infection	1.42	0.66	3.04	0.635
Surgical Site Infection	1.22	0.51	2.9	0.917
Mortality	1.22	0.51	2.9	0.917
Respiratory Failure	1.42	1	2.02	0.347
Pulmonary Embolism	1.09	0.57	2.07	0.674
Lower Deep Vein Thrombosis	1.49	0.9	2.44	0.392
Clavien-Dindo IV Complications	1.24	0.97	1.59	0.805
Cardiovascular Diseases	1.04	0.7	1.55	0.409