Superior Postoperative Outcomes Following Total Knee Arthroplasty are Associated with as Short as Three-Months of Semaglutide Use for Type II Diabetic Patients

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INTRODUCTION:
Semaglutide (Ozempic®) is considered a first-line therapeutic recommendation for the management of type II diabetes mellitus (T2DM). Diabetic patients are at high-risk for inferior outcomes following total knee arthroplasty (TKA), but semaglutide use at the time of TKA has shown to modify this risk. However, the minimum preoperative treatment duration of semaglutide associated with superior TKA outcomes has never been studied.
METHODS:
A retrospective cohort of adult patients with T2DM utilizing semaglutide (T2DM+semaglutide) prior to TKA were identified from the PearlDiver database. Exclusion criteria included: patients presenting for trauma, neoplasm, or infection, and <90-days follow-up. Five exclusive cohorts of semaglutide exposure were identified: <1mo, 1-2mo, 2-3mo, 3-6mo, and 6-12mo. Each cohort was individually matched 1:4 with non-semaglutide patients based on age, sex, Elixhauser Comorbidity Index, frequency of end-organ diabetes complications, obesity (body mass index >30), tobacco, metformin, and insulin use. Odds of 90-day severe adverse events (SAE) including surgical-site infection, sepsis, venous thromboembolism, cardiac events, and minor adverse events (MAE) including pneumonia, acute kidney injury, urinary tract infection, and wound complications were compared by multivariable logistic regression utilizing Bonferroni correction.
RESULTS:
After individual cohort matching of 4,762 T2DM+semaglutide TKA patients, <1mo, 2-3mo, 3-6mo, and 6-12mo of preoperative semaglutide exposure was identified for 91, 113, 210, 451, and 745 patients, respectively. Patients initiating semaglutide <1mo before TKA revealed lower odds of MAE (odds ratio [OR] 0.16, $p<0.001$), with consistent reduction in MAE across all increased semaglutide exposure lengths ($p<0.001$ for all). Reduced odds of SAE were significant after a minimum of 2-3mo of semaglutide exposure (OR 0.25, $p<0.001$).
DISCUSSION AND CONCLUSION:
Three-months of preoperative semaglutide utilization before TKA appears to be sufficient therapeutic exposure to reduce both minor and severe adverse events. These findings have major clinical implications and lay the foundation for prospective analysis aimed at preoperative glycemic optimization.