Risks and Rewards: a Mixed Picture for Glucagon-like Peptide 1 Agonist Therapy and Outcomes Following Femoral Shaft Fracture Fixation

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INTRODUCTION: Glucagon-like peptide 1 agonists (GLP-1) are widely used for the management of diabetes and obesity. However, their effects on patients undergoing surgical repair of femoral shaft fractures remain unclear. This study evaluates the potential impact of GLP-1 therapy on surgical and medical outcomes in patients who underwent femoral fracture repair.

METHODS: A retrospective cohort query was conducted from January 1, 2010 to January 1, 2022 using a national claims database to identify patients undergoing operative fixation of femoral shaft fractures on GLP-1 therapy, including open reduction internal fixation with plating (CPT-27506) or intramedullary implant (CPT-27507). Patients on GLP-1 (n=1,238) therapy at the time of surgery were propensity score matched 1:3 to controls who did not use GLP-1 agonists (n=3,643) based on age, sex, fracture pattern, procedure type, Charlson comorbidity index (CCI) and its components. 90-day outcomes included medical and surgical complications, reoperation, and readmission. 2-year incidence of revision arthroplasty and nonunion were also examined. Bivariate logistic regression was used to compute odds ratios (OR).

RESULTS: After propensity score matching, 1,238 femoral shaft fracture patients on GLP-1 therapy and 3,643 control patients were included in final analysis. 90-day rates of reoperation, readmission, deep venous thrombosis, pulmonary embolism, mortality, stroke, myocardial infarction, blood loss anemia, blood transfusion, wound complications and sepsis were comparable between cohorts ($p > 0.05$). However, the GLP-1 cohort experienced greater odds of acute kidney injury (AKI) (OR 1.32, 95% CI [1.10, 1.45]) and decreased odds of pneumonia (OR 0.66, 95% CI [0.51, 0.86]) and emergency department (ED) visits (OR 0.80, 95% CI [0.66, 0.96]). At 2-year follow-up, there was no significant difference in likelihood of experiencing revision arthroplasty or nonunion between cohorts ($p > 0.05$).

DISCUSSION AND CONCLUSION: GLP-1 therapy is associated with increased odds of AKI and decreased odds of pneumonia and ED visits 90-days postoperatively. However, all other 90-day medical and surgical complications and 2-year revision arthroplasty and nonunion rates were similar between cohorts. These potential perioperative benefits, and previously underreported risks, necessitate further research to better understand the long-term effects and pathophysiology of GLP-1 agonists on postoperative complications after fracture fixation.