GLP-1 Use and Impact on Outcome in Patients Undergoing Total Shoulder Arthroplasty

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Introduction: The increased utilization of glucagon-like peptide-1 (GLP-1) medications to manage Type 2 Diabetes Mellitus (T2DM) and weight loss has sparked efforts to investigate their impacts on total shoulder arthroplasty (TSA) outcomes. A study on GLP-1 usage in total hip and knee arthroplasty has reported a decrease in 90-day readmission rates and perioperative joint infections suggesting that GLP-1 patients had better outcomes. The data is less clear for TSA patients as conflicting studies have shown no effect outcomes while others suggest a protective effect from GLP-1 use. The purpose of this study is to determine the effects of GLP-1 usage in diabetic patients undergoing TSA and their effects on clinical outcomes.

Materials and Methods: The TriNetX database from 2005-2025 was used to identify two cohorts of diabetic patients who underwent TSA. Cohort 1 was composed of diabetic patients who were on GLP-1's within one year pre-operatively to two-years postoperatively. Cohort 2 was composed of diabetics who were not on GLP-1's one-year preoperatively to two-years postoperatively. Propensity score matching was performed using a 1:1 match based on preoperative demographic characteristics and comorbidities, including age, gender and body mass index after matching, each cohort was composed of 2,744 patients. Both medical and surgical complications were collected within a two-year follow-up window. For statistical analysis, categorical variables were compared using tests such as Pearson's chi-square test, while analysis for continuous variables utilized independent t-tests.

Results: The diabetic cohort on GLP-1 (Cohort 1) had a significantly lower risk of surgical complications such as prosthetic complications (RR= 0.786, p=0.009), removal of hardware (RR= 0.72, p=0.0498), dislocation (RR= 0.701, p=0.022), and broken hardware (RR= 0.467, p=0.015) when compared to those diabetics not taking GLP-1 (Cohort 2). Cohort 1 also had lower risk of medical complications such as readmission (RR= 0.857, p<0.001), emergency room utilization (RR= 0.893, p= 0.008), occupational therapy utilization (RR= 0.774, p<0.001), mortality (RR= 0.633, p=0.006), and transfusion rates (RR= 0.5, p= <0.001) when compared to Cohort 2.

Discussion: Diabetic TSA patients on GLP-1 medications have significantly decreased rates of various postoperative complications, both surgical and medical, when compare to the non-GLP-1 patients, indicating that GLP-1 medications offer a protective effect for diabetic patients undergoing TSA. This information can help with the development of preoperative patient optimization strategies with the aim of improving clinical outcomes and decreasing complications in the diabetic population.