Early Postoperative Opioid Use in Total Shoulder Arthroplasty Is Associated with Dose-Dependent Risk of Major Surgical and Medical Complications

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INTRODUCTION:
Higher perioperative opioid use has been associated with an increase in periprosthetic joint infection, thromboembolic complications, respiratory events, gastrointestinal complications, cost, and length of stay following hip and knee arthroplasty. Limited data regarding the relationship between the postoperative opioid dose and complication rates following primary total shoulder arthroplasty (TSA). The purpose of this study is to investigate the relationship between perioperative opioid consumption and postoperative complications following TSA.

METHODS:
The Premier Healthcare Database was queried to identify patients who underwent primary anatomic and reverse TSA from 2016-2020. Perioperative opioid consumption totaled utilizing milligrams of morphine equivalents (MMEs) to stratify patients based on quintiles of consumption. Primary outcomes included total opioid consumption, and 90-day postoperative complications, revision, and readmission. Bivariate and multivariate regression analyses were performed with statistical significance defined as $p<0.05$.

RESULTS:
140,251 patients undergoing primary TSA were identified and stratified based on total opioid consumption into quintiles (<22.3, 22.3-25, 25.01-52.5, 52.6-83.3,> 83.3). Patients with increased MME exposure were significantly younger, more often female, and Black ($p<0.0001$ for all). On multivariate analysis, increased MME exposure was associated with increased risk of multiple surgical complications, including superficial wound infection, PJI, periprosthetic fractures, seroma, loosening, unspecified mechanical complications, and 90-day readmission. Regarding medical complications, rates of postoperative hemorrhage, pulmonary embolism (PE), pneumonia, acute respiratory failure, acute renal failure, and UTI significantly increased upon exposure to higher MMEs.

DISCUSSION AND CONCLUSION:
Our study noted that there was a dose dependent increase in the risk of surgical and medical complications with increasing totals of opioid perioperative opioid consumption following total shoulder arthroplasty. Despite controlling for numerous variables, patients with increased opioid requirements in the perioperative period had increased risk of PJI, periprosthetic fracture, loosening, readmission as well as several medical complications such as PE, respiratory failure and renal failure.