Impact of Chronic Obstructive Pulmonary Disease on Total Hip Arthroplasty Outcomes and Temporal Trends in Perioperative Management.

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INTRODUCTION:

As total hip arthroplasty (THA) volumes increase, surgeons frequently encounter patients with complex medical profiles including chronic obstructive pulmonary disease (COPD). While COPD has been associated with adverse surgical outcomes across specialties, its specific impact on THA outcomes and the evolution of care strategies over time remain incompletely characterized. This study aimed to compare perioperative characteristics, complications, and readmission rates between THA patients with and without COPD while analyzing temporal trends in outcomes and anesthetic management.

METHODS:

This retrospective cohort study analyzed patients undergoing primary elective THA at an urban academic medical center between 2012-2020. A total of 871 patients with COPD were propensity-matched 1:3 to 3,308 non-COPD patients, controlling for age, sex, and BMI. Outcomes measured at 90 days included complications, readmissions, and length of stay. Multivariable regression analyses assessed the independent effect of COPD on outcomes, with temporal trend analysis performed across 2-year intervals. Anesthetic techniques and transfusion rates were tracked longitudinally to assess evolving perioperative management strategies.

RESULTS:

Patients with COPD demonstrated significantly higher baseline comorbidity burdens, including increased rates of cardiovascular disease, cerebrovascular disease, and tobacco use history. The COPD cohort experienced higher rates of all-type complications (23.4% versus 18.4%, P=0.001), 30-day readmissions (6.7% versus 3.9%, P=0.008), and longer hospital stays (2.5 versus 2.1 days, P=0.001). Patients with COPD were more likely to receive general anesthesia (25.8% versus 21.5%, P=0.007) and required more frequent packed red blood cell transfusions (12.6% versus 8.7%, P=0.001).

On multivariable analysis, COPD independently predicted increased readmission risk (OR: 1.42, P=0.036) but was not independently associated with complications or length of stay after controlling for comorbidities. Temporal analysis revealed encouraging trends in perioperative management and outcomes. Regional anesthesia utilization increased substantially over the study period for both groups, rising from approximately 60% to 83% in COPD patients and from 55% to 85% in non-COPD patients by 2020-21. Conversely, general anesthesia use decreased from approximately 40% to 20% in COPD patients over the same period. Post-operative transfusion rates decreased markedly for both cohorts. Most notably, readmission rates for COPD patients decreased substantially from 11.36% in 2012-13 to 5.03% in 2020-21, while hospital length of stay improved from 2.52 days to 1.95 days.

DISCUSSION AND CONCLUSION:

While patients with COPD undergoing THA experience higher initial rates of complications and readmissions compared to matched controls, much of this risk appears attributable to associated comorbidities rather than COPD alone. The observed temporal improvements in outcomes, coupled with evolving anesthetic practices favoring regional techniques and reduced transfusion requirements, suggest that perioperative optimization strategies can mitigate historical disadvantages associated with COPD in THA patients.