

Comparison of Pneumonia and Major Complications following Total Joint Arthroplasty with Spinal versus General Anesthesia: A Propensity-Matched Cohort Analysis

Andrew Harris¹, Nicholas S Andrade, Alex Gu², Gregory Golladay³, Savyasachi C Thakkar

¹Orthopaedic Surgery, Johns Hopkins Hospital, ²George Washington University School of Medicine An, ³VCU Health

INTRODUCTION:

Spinal anesthesia (SA) allows for total joint arthroplasty (TJA) to be performed while minimizing opioids and systemic anesthetic agents compared to general anesthesia (GA). SA has been associated with shortened postoperative recovery, however, the relationship between spinal anesthesia, major postoperative complications, and pneumonia (PNA) has not been well-studied.

METHODS:

Patients were identified in a large, national database who underwent total hip arthroplasty or total knee arthroplasty from 2010-2020. 1:1 propensity score matching was used to create matched groups of patients undergoing SA and GA. Groups were matched by age, sex, COPD, smoking status, Charlson comorbidity index (CCI) and American Society of Anesthesiology (ASA) classification. Further, 1:1 matching was performed among ASA classifications as a subanalysis.

RESULTS:

Overall, equally matched groups of 217,267 patients were identified who underwent SA vs. GA. A total of 850 (0.39%) of patients developed postoperative PNA following GA vs. 544 (0.25%) patients following SA, $p < 0.001$. The risk of major complications was 6,922 (3.2%) in the GA group vs. 5,401 (2.5%) in the SA group, $p < 0.001$. Similarly, the risk of unplanned postoperative reintubation was higher (0.18% vs. 0.10%, $p < 0.001$), as well as mortality (0.14% vs. 0.09%, $p < 0.001$). In ASA 1-3 patients, the risk of PNA was 0.08%-0.21% higher with GA vs. SA. In ASA 4 patients, the risk of PNA was 0.42% higher in SA vs. GA (1.92% vs. 1.5%, $p < 0.001$), rate of mortality was nearly doubled in GA vs. SA (1.46% vs. 0.77%, $p = 0.017$), while the rate of major complications was not significantly different with SA vs. GA.

DISCUSSION AND CONCLUSION:

Overall, GA is associated with a small but significantly higher rate of major complications, mortality, and PNA compared to SA in patients undergoing TJA. ASA 4 patients experienced increased absolute risk increases in mortality with GA vs. SA, however, the risk of PNA is higher in patients who underwent SA versus GA.