30-day Readmission after Total Hip and Knee Arthroplasty in Patients with Systemic Lupus Erythematosus: US Nationwide Data

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INTRODUCTION: Systemic lupus erythematosus (SLE) primarily affects young women and often leads to musculoskeletal complications requiring total hip or knee arthroplasty (THA/TKA). Despite advances in treatment, SLE patients face higher risks of perioperative complications, yet data on 30-day readmissions following THA/TKA is limited. This analysis examines these readmission trends from 2017 to 2020, identifying common reasons for readmission.

METHODS: We utilized the 2017-2020 Nationwide Readmission Database (NRD) to examine yearly national readmission rates, the reasons for readmission, and variables associated with readmission. The NRD is a national dataset that tracks patient readmissions across U.S. hospitals, enabling analysis of healthcare utilization and outcomes. We performed multivariable logistic regression models to investigate which covariates were associated with 30-day readmission. P-trends were calculated with the Pearson Chi-squared test accompanied by linear-by-linear association test. Post-hoc analysis was conducted to account for yearly outliers (2020). Charleson Comorbidity Index (CCI) was calculated to assess the degree of comorbidity associated for patients.

RESULTS: An estimated 19,631(unweighted=10,993) SLE patients with THA and 21,464 (unweighted=) SLE patients with TKA were hospitalized in the United States from 2017 through 2020. 30-day readmission rates were 6.85% for THA and 5.06% for TKA. Readmission significantly rose from 6.49% in 2017 to 9.24% in 2020 for THA patients (P trend =0.001). This remained significant even after post-hoc analysis to account for the individual year spike in 2020. However, no significant increase in readmission was seen for patients who received a TKA (example 5.54%-5.48%) (P trend =0.379) from 2017-2020. Sepsis (12.04%), cardiovascular complications (6.61%), respiratory (5.03%), and urinary (1.58%) were the leading cause for readmission after THA. Sepsis (13.44%), kidney/metabolic abnormalities (5.99%), cardiovascular complications (4.42%), and respiratory complications (4.24%) were the leading cause for readmission after TKA. Multivariate analysis showed that male patients (p <0.001; OR: 1.34 CI: [1.13, 1.58]) and younger age (p<0.001; OR: 1.026 CI: [1.021, 1.030]) was associated with increased odds of readmission after THA. Higher CCI scores are associated with 9% increased odds of readmission (p<0.001; OR: 1.09 CI: [1.05, 1.131]) after THA in addition to patient disposition at discharge (p<0.001 OR:1.061 CI: [1.039, 1.083]. Patient location (p<0.001 OR: 0.892 CI: [.852, .935]) and younger age (p=0.004; OR: 0.992 CI: [.985, .997]) were associated with reduced odds of readmission after TKA. The odds of readmission increase by 7.2% with every unit increase in CCI score (p<0.001; OR: 1.072 CI [1.032, 1.114]) for patients who undergo TKA.

CONCLUSION: This study highlights the significant increase in readmission rates for SLE patients undergoing THA, with the most frequent reasons including sepsis, cardiovascular, and respiratory complications. The association between higher comorbidity scores and increased readmission risk emphasizes the need for targeted perioperative strategies, especially for patients with a complex comorbid burden. The study has limitations, including its retrospective design and reliance on database coding, which may not capture all relevant clinical nuances. Our findings suggest that current infection control measures may be insufficient for this immunocompromised population, highlighting the necessity for enhanced, SLE-specific prophylactic protocols and vigilant monitoring.

SIGNIFICANCE/CLINICAL RELEVANCE: This study reveals critical insights into the increased readmission risks for SLE patients after THA, emphasizing the need for tailored perioperative care to address the unique challenges of this population. These findings can inform clinical practices aimed at minimizing complications and improving outcomes in SLE patients undergoing joint arthroplasty.
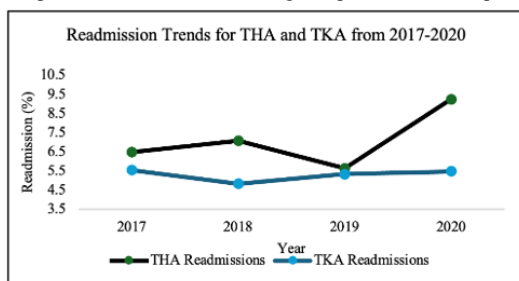

Figure 1: Readmission trends from 2017-2020 for total hip arthroplasty (THA) and total knee arthroplasty (TKA).
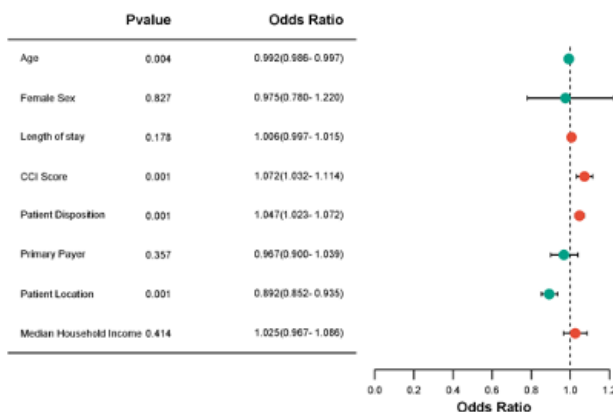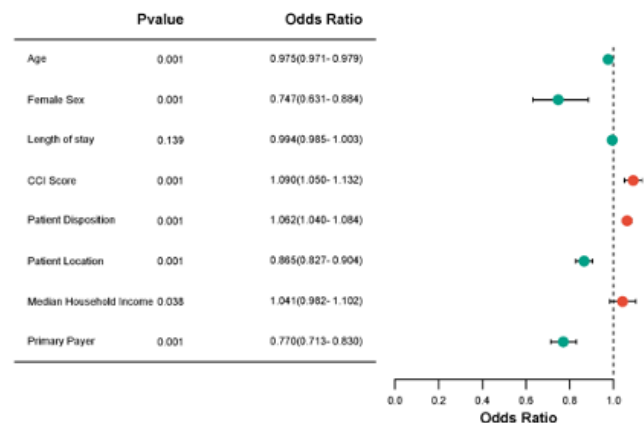

Figure 2: Forest plot showing odds ratios of covariates associated with 30-day readmission after THA

Figure 3: Forest plot showing odds ratios of covariates associated with 30-day readmission after TKA