Do Disease Modifying Anti-Rheumatic Drugs Impact Complication Rates after Total Hip Arthroplasty in Patients with Inflammatory Arthropathies? A Matched Cohort Study

Ahmadreza Nezameslami M.D.[1], Bryce Hrudka M.D.[1] , Bailey Ross M.D.[1], David Mathews M.D., PhD[1], Jacob Michael Wilson M.D.[1], Ajay Premkumar M.D, MPH[1]. [1]Emory University, Atlanta, GA, USA.

Email of Presenting Author: Ahmadreza.nezameslami@emory.edu

Disclosures: Bryce Hrudka M.D.(N), Ahmadreza Nezameslami M.D. (N), Bailey Ross M.D. (N), David Mathews M.D., PhD(N), Jacob Michael Wilson M.D. (N), Ajay Premkumar M.D, MPH(N).

INTRODUCTION: Disease-modifying anti-rheumatic drugs (DMARDs) have been profoundly impactful in the treatment of inflammatory arthritides such as Rheumatoid Arthritis (RA), Psoriatic Arthritis (PsA), and Juvenile Idiopathic Arthritis (JIA). With increasing annual utilization of total hip arthroplasty (THA), a growing number of these patients are undergoing elective THA for surgical treatment of end-stage hip arthritis. It is unclear how DMARD utilization impacts clinical outcomes after THA in this population. Therefore, the purpose of this study was to compare short-term outcomes after THA amongst patients with inflammatory arthritides with versus without DMARD treatment. It was hypothesized that complication rates would be lower in the treatment cohort.

METHODS: A retrospective matched cohort study was conducted using a large national administrative claims database. All patients undergoing primary THA (CPT-27130) between 2009—2020 with a concomitant diagnosis of RA, PsA, and/or JIA were identified. The subset of this population on DMARD therapy was defined by at least one prescription claim for a biologic or conventional DMARD within 90 to 360 days before the index THA. This treatment cohort was then propensity score matched with controls undergoing THA with inflammatory arthritis at a 1:1 ratio across age, sex, Elixhauser comorbidity index, inflammatory diseases, medical comorbidities, and corticosteroid exposure. Rates of medical and implant-related complications at 90 days were compared between the matched cohorts using chi-square analysis with an alpha of 0.05. Implant survivorship was compared with Kaplan Meier curves and Cox proportional hazards regressions.

RESULTS: A total of 26,867 patients (male and female) were identified, of which 4,022 (15.0%) were on DMARD therapy. Propensity score matching yielded 4,022 patients in each cohort. Within the treatment cohort, compared to untreated controls, patients treated with conventional DMARDs exhibited a significantly lower rate of surgical site infection at 90 days (1.4 vs 2.2%, $p = 0.019$) while rates of other medical and implant-related complications were comparable. At two years, implant survivorship with respect to septic revision was significantly lower among patients treated with biologic DMARDs (94.6 vs 95.8%; HR 1.41; 95% CI, 1.10—1.81).

DISCUSSION: In this large retrospective cohort study using a large claims database, conventional DMARD treatment was associated with lower rates of SSI within 90 days while patients on biologic DMARD therapy exhibited significantly higher rates of septic revisions compared to matched controls. Given the nature of the data source we had, we were unable to confirm whether patients took the prescribed medication at the correct dosage or whether they used other concurrent therapies. This limitation of the study was beyond our control. While this study design inherently can not control inflammatory disease severity, this data suggests that DMARD use perioperatively may alter infection risk after THA. In this light, the importance of adhering to current ACR/AAHKS guidelines for perioperative medication management to maximize patient outcomes. Further research is needed to investigate the potential impact on immunomodulation of specific DMARDs on outcomes after THA.

SIGNIFICANCE/CLINICAL RELEVANCE: This study evaluated associations between DMARD use and THA revision risk and noted individual DMARD classes may carry specific elevated risk. Further research is required to better understand the potential immunomodulatory effects of these commonly prescribed medications as it relates to PJI risk after THA.

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