

# The Impact of Disease Modifying Anti-Rheumatic Drugs Effects on Complication Rates after Total Knee Arthroplasty in Patients with Inflammatory Arthropathies

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**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). DMARDs have immunomodulatory mechanisms of action which can alter perioperative risks after various surgeries. As annual utilization of total knee arthroplasty (TKA) continues to rise, an increasing number of patients on DMARDs are undergoing elective TKA for surgical treatment of end-stage knee arthritis. It is unclear how DMARD utilization impacts clinical outcomes after TKA in this population. Therefore, the purpose of this study was to compare short-term complication rates and implant survivorship 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 (male and female) undergoing primary TKA (CPT-27447) 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 TKA. This treatment cohort was then propensity score matched with controls 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 and implant survivorship at two years were compared between the matched cohorts using chi-square analysis and Kaplan Meier curves, respectively, with an alpha of 0.05. Subgroup analysis of complication rates based upon utilization of conventional, biologic, and targeted DMARDs were also performed.

**RESULTS:** A total of 55,289 patients were identified, of which 8,462 (15.3%) were on DMARD therapy. After matching, 8,461 treated patients were successfully assigned to each cohort. The treatment cohort exhibited a significantly lower rate of extended length of stay (LOS) during the index TKA (52 vs. 57%,  $p < 0.001$ ). Rates of all other 90-day complications including periprosthetic joint infection, sepsis, dislocation, deep vein thrombosis, readmission, and reoperation were statistically comparable in both the aggregate and subgroup analyses (all  $p > 0.05$ ). Implant survivorship at two years was also statistically comparable amongst patients on a biologic DMARD (94.8%), conventional DMARD (94.2%), and untreated patients (94.2%).

**DISCUSSION:** Amongst patients with inflammatory arthritides undergoing primary elective TKA, rates of 90-day medical and implant-related complications and implant survivorship at two years were comparable amongst patients who received DMARD therapy and those who did not. 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. Further research on the impact of immunomodulatory drugs on postoperative complication risk in this population is warranted.

**SIGNIFICANCE/CLINICAL RELEVANCE:** This study evaluated associations between DMARD and individual DMARD classes and TKA revision risk. This study highlights the relative safety of DMARD use in this population, and further research is required to better understand the potential immunomodulatory effects of these commonly prescribed medications as it relates to risk after TKA.

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