Suppressive Antibiotic Therapy after Total Joint Arthroplasty Debridement, Antibiotics, and Implant Retention (DAIR) is Well-Tolerated and Does Not Induce Resistance: A Multicenter Study

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INTRODUCTION: Multiple studies have demonstrated suppressive antibiotic therapy (SAT) after total joint arthroplasty (TJA) debridement, antibiotics, and implant retention (DAIR) maximizes reoperation-free survival. However, little is known regarding sequelae of SAT for periprosthetic joint infection (PJI). Our aims were to evaluate SAT after DAIR of acutely infected primary TJA regarding: 1) adverse drug reaction (ADR)/intolerance; 2) reoperation for infection recurrence; and 3) antibiotic resistance.

METHODS: Patients who underwent TJA DAIR for acute PJI at two academic medical centers from 2015-2020 were identified (n = 116). Data were collected on patient demographics, infecting organism, antibiotics, ADR/intolerance, reoperation, and antibiotic resistance. Patients who met study endpoints were compared to those who did not. Univariate and stepwise multivariate logistic regression were used to identify covariates significantly associated with outcomes of interest, including ADR/intolerance and reoperation for infection recurrence.

RESULTS: Mean SAT duration was 14.9 months; 12.9% of patients had ADR/intolerance to SAT. Patients prescribed trimethoprim/sulfamethoxazole (TMP-SMZ) had increased risk of ADR/intolerance ($p = 0.0472$). Reoperation-free survival was 75.9% at mean 2.8-year follow up. Risk of reoperation for infection recurrence was higher among *Staphylococcus aureus* infections ($p = 0.0029$) and lower with increased SAT duration ($p=0.0040$). The optimal duration of SAT was 2.2 years, after which there was no additional benefit to reoperation-free survival. There were no cases of antibiotic resistance that developed in recurrent infections.

DISCUSSION AND CONCLUSION:

SAT after TJA DAIR is well-tolerated. Use of TMP-SMZ should be minimized due to increased likelihood of ADR/intolerance. SAT should always be considered after DAIR due to improved reoperation-free survival and favorable safety profile. Over one year of SAT did not induce antibiotic resistance among infecting organisms.