Trends in Extended Oral Antibiotic Prophylaxis After Primary Total Knee Arthroplasty

Vivek Anand Pisharody[1], Andrew Alexander Fuqua, Ayomide Micheal Ayeni, Greg Erens, Jacob Michael Wilson, Ajay Premkumar

[1]Emory University School of Medicine

INTRODUCTION:

Recent evidence suggests extended courses of prophylactic oral antibiotics (EOA) after total knee arthroplasty (TKA) may reduce the risk of periprosthetic joint infection (PJI) in high-risk patients. There is a lack of epidemiologic data on EOA prophylaxis. We investigated national trends in EOA prophylaxis for primary TKA and whether these rates were reflective of changes in patient risk or prescribing practices.

METHODS:

We identified adult TKA cases between 2009 and 2022 in a national insurance claims database (Meerative Marketscan). EOA was defined as a 7-14 day course of first-generation cephalosporins, cefdinir, clindamycin, doxycycline, or trimethoprim-sulfamethoxazole filled 5 days pre-op to 3 days post-op. Patients with a history of infected lower extremity hardware or septic arthritis were excluded, as were patients with any infection concurrent with index operation. Annual EOA rates were calculated stratified by PJI risk. Multivariable logistic regression was used to explore whether EOA rates reflected changing patient characteristics. Future EOA rates were predicted with time-series forecasting.

RESULTS: We identified 712,212 eligible TKA cases across 616,453 patients. 570,584 cases (80.0%) were performed for primary osteoarthritis. High-risk comorbidities were present in 362,588 cases (50.9%). EOA rates rose from 0.91% in 2009 to 7.95% in 2022. Rates increased by 686% among standard-risk patients and 786% among high-risk patients. Logistic regression models using patient comorbidities could not account for changes in EOA rates (pseudo-R^2=0.01). EOA rates were projected to rise to 18.3% by 2030.

DISCUSSION AND CONCLUSION: From 2009 to 2022, rates of EOA prophylaxis dramatically increased. This trend could not be explained by changing patient characteristics, suggesting changes in prescribing practices are likely reflective of a relatively small number of recently-published cohort studies evaluating EOA. There is a need for further high-quality research on the criteria for and safety and efficacy of EOA prophylaxis.

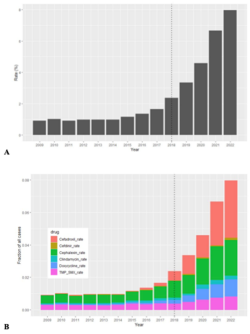

Figure 1. Trends in extended oral antibiotic prophylaxis after primary TKA, 2009-2022. Several papers (such as [7–9,16]) on the use of EOA prophylaxis after TKA were published in or after 2018 (vertical line).

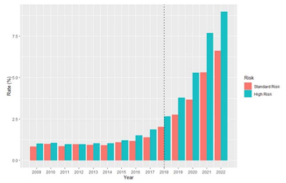

Figure 2. Trends in EOA prophylaxis after TKA divided by risk cohorts.

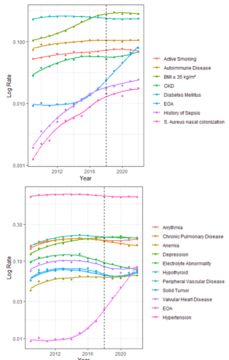

Figure 3. (A) Rates of EOA prophylaxis over time versus rates of high-risk comorbidities on a logarithmic scale. (B) Rate of EO versus additional patient characteristics that differed between EOA and non-EOA cohorts. No measured patient characteristics increased comparably to the rise in EO rates.