Total Knee Arthroplasty Patients With Previous History of Medical Noncompliance Have Higher Odds of Adverse Events

Lucas Kim[1], Jonathan N Grauer[1]
[1]Yale School of Medicine Department of Orthopaedics and Rehabilitation, New Haven, CT
Lucas.kim@yale.edu

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INTRODUCTION: Total knee arthroplasty (TKA) is a common elective surgery to treat end-stage osteoarthritis. To maximize success and minimize surgical risk, many hospitals have implemented perioperative pathways to optimize patients for successful outcomes and minimal complications. Such pathways require a high amount of commitment and adherence from patients. Despite the need for a large amount of commitment, the correlation of prior history of medical noncompliance on adverse outcomes following TKA has yet to be studied.

METHODS Adult patients undergoing primary TKA were identified from the large, multi-insurance, administrative 2010-2023 Q1 PearlDiver M170 database. Studies performed using this database were deemed exempt from review by our Institutional Review Board. Inclusion criteria included: age > 17 years, no infections, neoplastic, or traumatic diagnoses within 90 days preoperative, and being active in the database for at least 90 days postoperatively. Patient factors extracted included: age, sex, and Elixhauser Comorbidity Index (ECI).

From this study population, two sub-cohorts were created: 1) patients with a previously recorded history of noncompliance to medication or medical treatment and 2) patients without a history of such noncompliance. The two sub-cohorts were matched 1:4 based on age, sex, and ECI. The incidence of 90-day postoperative adverse events (specifically myocardial infarction [MI], sepsis, surgical site infection, deep vein thrombosis [DVT], cardiac arrest, pulmonary embolism [PE], acute kidney injury [AKI], pneumonia, wound dehiscence, urinary tract infection [UTI], hematoma, transfusion, emergency department visits [ED Visits], and readmissions) were abstracted and compared with multivariable logistic regression controlling for age, sex, and ECI. The 5-year rate of revision TKA was also compared using Kaplan-Meier analysis.

RESULTS SECTION: Of the 1,089,735 TKA patients identified, a previous history of medical noncompliance was noted for 18,147 (1.7%). Noncompliant patients were significantly younger, more likely to be male, and had a higher comorbidity burden. After matching, there were 17,712 medically noncompliant patients and 70,627 control patients. The matched cohorts were statistically no longer different across the matched criteria and were 59% female.

On multivariable analysis after application of the Bonferroni correction, patients with a history of previous medical noncompliance had higher odds of MI (odds ratio [OR] 1.33), sepsis (OR 1.21), AKI (OR 1.26), wound dehiscence (OR 1.20) pneumonia (OR 1.18), ED visits (OR 1.50), and readmissions (OR 1.17) ($p < 0.001$ for all). Patients with a history of noncompliance had lower odds of transfusion (OR 0.65, $p < 0.001$) (Figure 1). There was no significant difference in survival to 5-year revision TKA between the matched cohorts.

DISCUSSION: TKA patients with a previous history of medical noncompliance had higher odds of a number of defined medical complications within 90 days after surgery compared to control patients. These results may help guide surgeons in advising patients during the preoperative process and can guide preparations to minimize the possibility or impact of such complications.

SIGNIFICANCE/CLINICAL RELEVANCE: (1-2 sentences): Optimization for ideal outcomes in total knee arthroplasty requires a large amount of commitment and compliance. The present study demonstrates that TKA patients with a demonstrated history of noncompliance had higher odds of certain adverse events after surgery.

IMAGES AND TABLES:

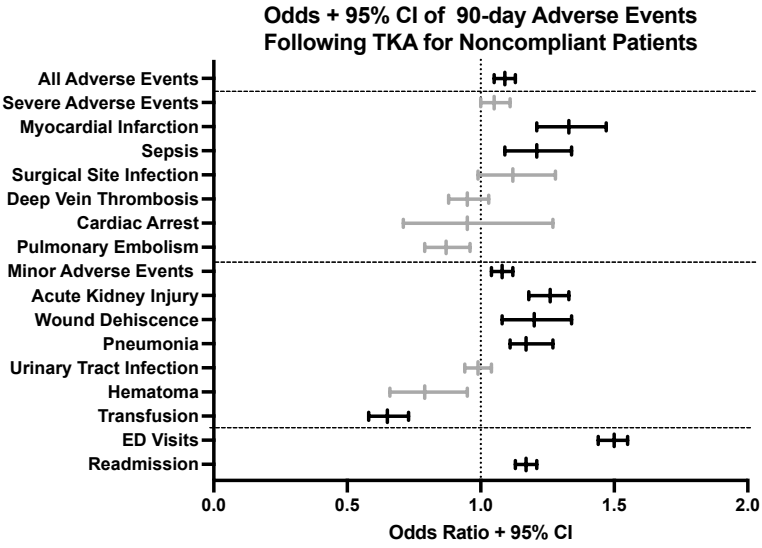

Figure 1: Forest plot of odds ratio and 95% confidence interval of adverse events within 90 days after TKA for patients with and without history of medical noncompliance.