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Patient-Reported Allergies Are Associated With Poorer Patient Satisfaction and Outcomes After Lower Extremity Arthroplasty: A Retrospective Cohort Study

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ABSTRACT

Anecdotal evidence suggests that patient-reported allergies (PRAs) may exhibit prognostic value for patient-reported outcomes after lower extremity arthroplasty. This study's purpose was to investigate associations between PRAs, patient satisfaction and outcomes after total hip arthroplasty (THA) and total knee arthroplasty (TKA). PRAs in 274 patients undergoing primary THA and 257 patients receiving primary TKA were reviewed retrospectively. Satisfaction scores, baseline Western Ontario and McMaster Universities Arthritis Index (WOMAC), 2-year postoperative WOMAC and length-of-stay (LOS) were analyzed with PRAs. Increasing number of PRAs was significantly associated with worse satisfaction scores and worse WOMAC scores for TKA and THA, and it was significantly associated with increased LOS for TKA. These results may have implications for patient counseling and risk-adjusted outcome models.

Despite generally excellent outcomes, dissatisfaction after primary total hip arthroplasty (THA) and primary total knee arthroplasty (TKA) is not uncommon [1–4]. While surgeon experience, surgical technique, and implant choice are important factors, patient-specific characteristics may adversely affect patient satisfaction and patient-reported outcomes (PROs) after lower extremity arthroplasty [5–24]. Anecdotal observation suggests that patients with multiple patient-reported allergies (PRAs) may represent a clinically challenging group of patients, who report worse satisfaction and outcomes after orthopedic surgery. Furthermore, there is evidence of a robust association between dissatisfaction with medical care and allergic-type symptoms without clear organic etiology [25]. Although the development of true metal hypersensitivity can lead to THA and TKA failure [26], to our knowledge, there are no published studies investigating the association between non-specific PRAs and patient-reported satisfaction and PROs after lower extremity arthroplasty.

The purpose of this study was to investigate the associations between baseline PRAs and (1) patient satisfaction two years after THA and TKA, (2) PROs two years after THA and TKA, and (3) hospital length-of-stay (LOS). We hypothesized that increasing number of PRAs is associated with worse patient satisfaction, worse PRO scores, and increased LOS.

Materials and Methods

Institutional review board approval was obtained before the initiation of this retrospective cohort study. An electronic search of the medical record from a single, high-volume, tertiary care, private teaching hospital in an urban setting, using ICD-9 codes 81.51 (THA) and 81.54 (TKA), was conducted over an arbitrary 10-week period (October 2010 to December 2010) to identify all THA and TKA procedures performed during that time. Patients were excluded if they received bilateral surgery, hemiarthroplasty, hip resurfacing arthroplasty (HRA), had preoperative fracture, or underwent any concomitant procedure(s). Patients were also excluded if they received subsequent surgery in the 2 years following THA or TKA, if they did not complete baseline or 2-year outcome surveys for the institutional arthroplasty registry.

Basic demographic information, LOS, and PRAs were recorded from the electronic medical record. Charlson–Deyo Comorbidity Index (CDCI), satisfaction ratings, and clinical outcome scores were obtained from the arthroplasty registry. A patient satisfaction questionnaire, using Likert-type scales, was administered two years after surgery. The questionnaire assessed patient satisfaction in regard to postoperative pain relief, ability to perform housework and yard work, ability to perform recreational activities, overall satisfaction, and subjective improvement in quality of life. Clinical outcomes scores were measured

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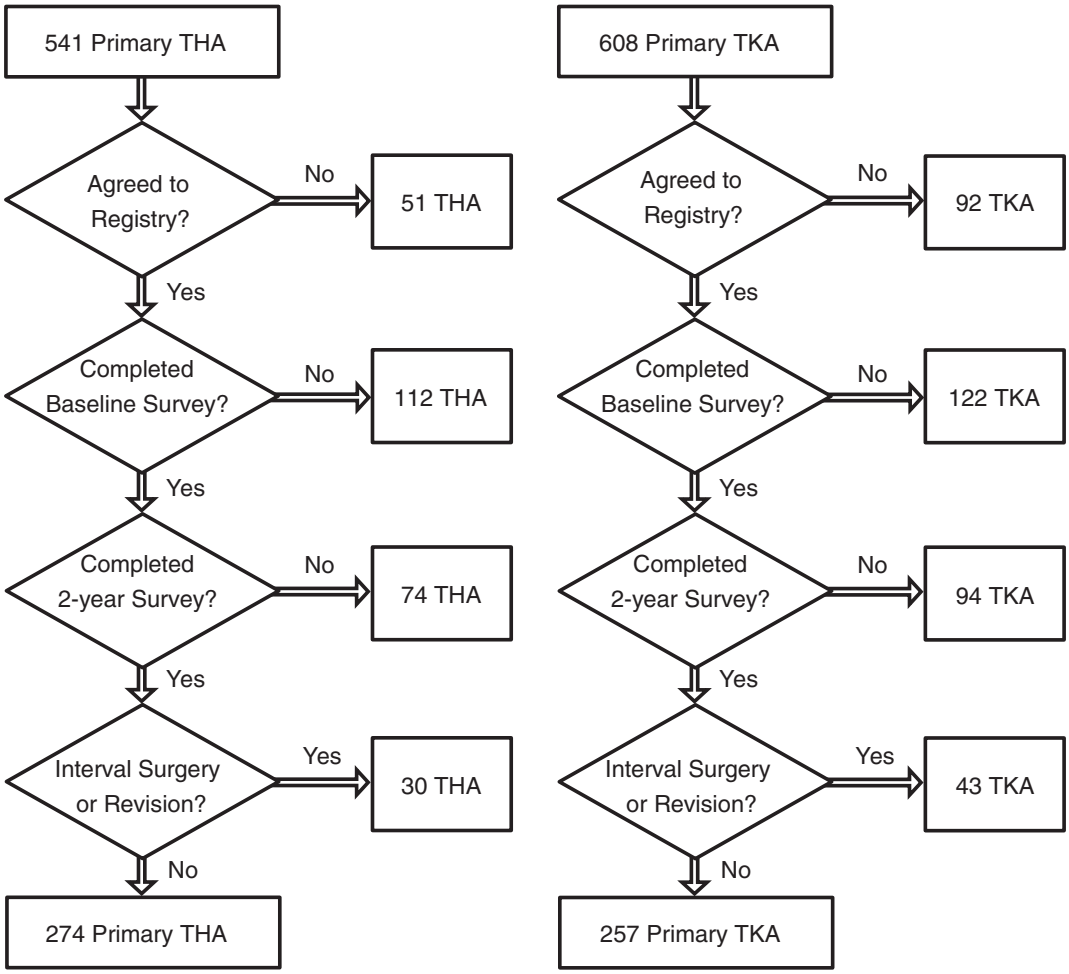

Fig. 1. Flowchart showing the formation of study cohorts for total hip arthroplasty (THA) and total knee arthroplasty (TKA).

using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). These were recorded within six months before surgery and at two years postoperatively.

Statistical Methods

THA and TKA were analyzed separately. Descriptive statistics were used to summarize baseline patient demographics, clinical characteristics, and PRAs. Means and standard deviations for continuous variables were calculated. Frequency and percentage were calculated for categorical variables.

For analysis, Likert-type scale responses from the satisfaction questionnaire regarding pain, housework, recreational activities and overall satisfaction were dichotomized into (1) somewhat to very satisfied, and (2) somewhat to very dissatisfied, or neither satisfied or dissatisfied. Similarly, responses to the survey regarding improved quality of life were dichotomized into (1) moderate to great improvement, or more improvement than ever dreamed possible, and (2) a little improvement, no improvement or worse. CDCIs were dichotomized into (1) an index score of 0, and (2) a score ≥ 1, for the regression analyses. Logistic regression was performed on satisfaction questions, treating PRA as a continuous variable. Multiple linear regression analyses were performed to examine the association between PRAs and WOMAC scores at baseline, two years post-surgery, and overall improvement in WOMAC at two years, with PRA analyzed as a continuous variable. All regression analyses were preformed adjusting for age, gender, CDCI, and body mass index (BMI). Analyses of the WOMAC scores at two years postoperatively and the change in WOMAC scores from baseline to two years postoperatively were adjusted for baseline scores.

All tests were two-sided, with a significance level of 0.05. All analyses were conducted using SAS for Windows 9.3 (SAS Institute Inc., Cary, NC).

Results

One thousand three hundred forty-one patients were initially identified from the electronic medical record, of which 192 patients were excluded for bilateral surgery, hemiarthroplasty, HRA, fracture care, or concomitant surgical procedure. After additional exclusion criteria were applied, 274 TKA and 257 THA were available for final analysis (Fig. 1). Baseline patient characteristics, including PRAs and WOMAC scores are summarized in Table 1. Approximately 53% of THA and TKA patients had no PRA, and 21.6% of THA and 25.7% of TKA had more than one PRA. 69.8% of allergens were medications, 16.2% were environmental exposures, and 14.0% were foods. The maximum number of PRA was 11 and 14 for THA and TKA, respectively.

Mean LOS for THA was 3.3 $\pm$ 0.9 days (median, 3.0 days) and 3.9 $\pm$ 1.1 days (median, 4.0 days) for TKA. In general, the majority of patient-reported satisfaction scores were positive (Table 2), and the mean changes observed in WOMAC scores at two years after arthroplasty met the criteria for clinical significance for TKA and THA patients (Table 3).

Despite generally high levels of patient-reported satisfaction at two years, logistic regression analysis demonstrated that increasing number of PRAs in THA patients was significantly associated with increased odds