



Diabetes as a risk factor for poorer early postoperative outcomes after shoulder arthroplasty

Brent A. Ponce, MD^{a,*}, Mariano E. Menendez, MD^{a,b}, Lasun O. Oladeji, MS^a, Francisco Soldado, MD, PhD^b

^a*Division of Orthopaedic Surgery, University of Alabama at Birmingham, Birmingham, AL, USA*

^b*Department of Orthopaedic Surgery, Universitat Autònoma de Barcelona, Barcelona, Spain*

Background: Although diabetes has been associated with increased perioperative morbidity and mortality after hip and knee arthroplasty, its impact on early postoperative outcomes after shoulder replacement remains relatively unexplored. The purpose of the study was to determine the association of diabetes with in-hospital death, complications, length of stay, non-homebound disposition, and cost in patients undergoing shoulder arthroplasty.

Methods: By use of the Nationwide Inpatient Sample database for the year 2011, an estimated 66,485 patients having undergone shoulder arthroplasty were identified and separated into groups with (21%) and without (79%) diabetes mellitus. Comparisons of specific outcome measures between diabetic and nondiabetic cohorts were performed by bivariate and multivariable analyses with logistic regression modeling.

Results: Diabetes mellitus was independently associated with in-hospital death, a number of perioperative complications, prolonged hospital stay, and increased non-homebound disposition after shoulder arthroplasty. The presence of diabetes was not associated with increased hospital cost.

Conclusion: Patients with preexisting diabetes are at higher risk for perioperative morbidity and mortality after shoulder arthroplasty. Future prospective research should explore in more detail the relationship between diabetes and shoulder arthroplasty outcomes.

Level of evidence: Level II, Retrospective Design, Prognosis Study.

© 2014 Journal of Shoulder and Elbow Surgery Board of Trustees.

Keywords: Diabetes; shoulder arthroplasty; perioperative; complication

Diabetes mellitus is a multisystem disorder associated with premature death and presently constitutes a concerning health problem worldwide.^{13,15,20,49} Currently, half of the patients with diabetes are older than 60 years, making

this clinical entity an important factor to consider in arthroplasty surgery planning.³²

The national prevalence of diabetes mellitus is rising at an alarming rate, driven by the obesity epidemic and sedentary lifestyles in industrialized countries and by an ever-expanding aging population.^{13,20,31,34,42,49,50} In 2010, an estimated 18.8 million people in the United States were diagnosed with diabetes mellitus¹¹; these numbers are expected to reach 30 million by 2030.⁵⁰ Lifestyle modifications, such as regular physical activity, are of paramount importance in the management of diabetes.¹⁰ Concomitant

Our Institutional Review Board has determined that this study is exempt from IRB review. The data are de-identified and commercially available online.

*Reprint requests: Brent A. Ponce, MD, Division of Orthopaedic Surgery, University of Alabama at Birmingham, 1313 13th Street South, Suite 203, Birmingham, AL 35205, USA.

E-mail address: bponce@uabmc.edu (B.A. Ponce).

osteoarthritis is present in more than 50% of diabetic patients but constitutes a barrier to increasing exercise intensity that may eventually lead to joint arthroplasty.^{1,10}

Although diabetes mellitus has been associated with increased perioperative morbidity after hip and knee replacement,^{1,5,25,27,32,41,46} scant data are available on early postoperative outcomes after shoulder arthroplasty, a procedure that is becoming increasingly popular.^{14,26,28} Anecdotal evidence suggests that diabetic patients have greater perioperative complications after shoulder arthroplasty, yet there is little published evidence to support this conclusion.²⁵

This study provides an analysis of the impact of preexisting diabetes on perioperative outcomes in a large cohort of individuals admitted to hospitals in the United States for shoulder arthroplasty. The aim of this study was to evaluate the association between diabetes and perioperative complications, in-hospital death, prolonged hospital stay, nonroutine disposition, and increased hospital charges in patients undergoing shoulder arthroplasty. Specifically, we tested the null hypothesis that among patients undergoing shoulder arthroplasty, and accounting for confounding factors, there are no differences between diabetics and nondiabetics with respect to inpatient outcomes.

Materials and methods

The current study was exempt from approval by our Institutional Review Board because all data used in this project were adequately de-identified beforehand.

The Nationwide Inpatient Sample (NIS), an initiative first sponsored by the Agency for Healthcare Research and Quality in 1988 and available yearly since then, was the source for all demographic, clinical, and resource use data subject to analysis.²¹ The NIS is the largest publicly available all-payer inpatient discharge database in the United States.³⁰ It consists of a 20% random sample of all hospital discharges from selected hospitals in participating states.³⁵ Each year's sample contains information from approximately 8 million hospital stays at more than 1000 nonfederal hospitals. The numbers from these hospitals are then weighted to produce statistically valid national estimates.³⁵ A maximum of 25 medical diagnoses and 15 procedures are identified with the use of the *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD-9-CM) codes. Additional information collected in the database includes patient and hospital characteristics and inpatient outcomes including discharge disposition, length of stay, and total hospitalization charges.^{22,43} In recognition of its utility to answer valuable clinical questions, the NIS has been used extensively to analyze data associated with a wide range of diagnoses and procedures across different medical specialties.^{4,7,12,17,35,37}

Our study population consisted of adults (≥ 18 years) undergoing shoulder arthroplasty between January 1, 2011, and December 31, 2011. Discharges with a procedure code (ICD-9-CM) for total shoulder arthroplasty (81.80), hemiarthroplasty (81.81), and reverse shoulder arthroplasty (81.88) were included in the sample. Patients were classified as having diabetes (type 1

or type 2, with or without chronic complications) with the use of ICD-9-CM diagnosis codes 250.00 to 250.93. All other patients who underwent a shoulder arthroplasty without a diabetes diagnostic code composed the nondiabetes group. Concurrent medical comorbidities as well as postoperative complications were also defined by ICD-9-CM diagnosis codes and the Clinical Classifications Software categories.^{19,23,37} These categories aggregate large numbers of individual ICD-9 diagnostic codes into broad diagnosis groups to facilitate statistical analysis and reporting.^{19,23,37}

Patient demographic and health care system-related characteristics were compared between patients with and without diabetes, patients with diabetes type 1 and type 2, and patients with uncomplicated and complicated diabetes (Tables I and II). Explanatory variables consisted of age (both continuous and categorized into the age groups 0-44, 45-64, 65-74, and >75 years), gender, race, medical comorbidities, household income based on postal zip code analysis (\$1-\$38,999, \$39,000-\$47,999, \$48,000-\$62,999, and \geq \$63,000), patient insurance status, hospital bed size (small, medium, and large), hospital geographic region (North-East, Mid-West, South, and West), hospital size (6-99, 100-199, 200-299, 300-499, and >500 beds), and procedure type (total shoulder arthroplasty, hemiarthroplasty, and reverse shoulder arthroplasty).

The presence of (1) perioperative complications, (2) in-hospital death, (3) prolonged hospital stay, (4) nonroutine discharge, and (5) increased hospital cost constituted the five dependent dichotomous outcome variables. A prolonged hospital stay and increased hospital cost were defined as an average length of stay and hospital cost greater than the 75th percentile.^{19,37} Discharge disposition status was dichotomized to routine (home) and nonroutine (short-term hospital, skilled nursing facility, intermediate care, another type of facility, home health care, against medical advice, and death). Normal distribution of the data was assumed on the basis of the large sample size. In bivariate analysis, the diabetes and nondiabetes groups were compared by Pearson χ^2 test for categorical data and independent samples *t* test for continuous data. Multivariable binary logistic regression analyses were performed to examine whether diabetes was an independent risk factor for complications, mortality, prolonged hospital stay, nonroutine discharge, and higher hospital charges after shoulder replacement. Each multivariable regression model was adjusted for age, gender, race, and comorbidities and reported as an odds ratio with respect to 95% confidence interval. A *P* value $< .05$ was deemed to be statistically significant in all analyses. SPSS version 22.0 (SPSS, Chicago, IL, USA) was used for all statistical analyses and data modeling.

Results

During 2011, an estimated total of 66,485 patients underwent shoulder arthroplasty, 13,730 (21%) with and 52,755 (79%) without diabetes (Table I); 44% of the patients received a total shoulder arthroplasty, 23% hemiarthroplasty, and 33% reverse shoulder arthroplasty. Patients with diabetes tended to be older (70 ± 9.4 years vs 69 ± 13 years; $P < .001$), females (59% vs 57%; $P = .004$), living in the South (41% vs 38%; $P < .001$), and of a different racial distribution ($P < .001$) and to have received

Download English Version:

<https://daneshyari.com/en/article/4074428>

Download Persian Version:

<https://daneshyari.com/article/4074428>

[Daneshyari.com](https://daneshyari.com)