

Stratification of 30-Day Major Complication Risk using Body Mass Index Thresholds for Patients Undergoing Total Knee Arthroplasty

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INTRODUCTION:

Increased Body Mass Index (BMI) is a risk factor for knee osteoarthritis. Thus, patients with elevated BMI are much more likely to require Total Knee Replacement (TKA). Elevated BMI has been demonstrated to be a risk factor for adverse outcomes following TKA, leading some centers to advocate that patients above certain BMI thresholds avoid surgery or lose weight prior to this elective procedure. Given the significant improvement in quality of life and increased likelihood of weight loss following TKA, it is important to understand the relationship between BMI and complication risk after TKA.

METHODS:

A national database was used to identify patients who underwent primary TKA from 2000 to 2020. 30-day major postoperative complications were defined as pulmonary embolism, hospital readmission, cardiac arrest, myocardial infarction, reintubation, renal failure and mortality. 30-day major complication risk was analyzed using stratum-specific likelihood ratios (SSLR) with BMI as the independent variable. The resulting adjusted-likelihood of major complications based on these thresholds was examined using a logistic regression model.

RESULTS:

403,123 patients were identified, mean age 67 ± 9.4 , mean BMI 33 ± 6.2 . 10,937 (2.7%) of patients sustained a major complication. BMI thresholds were defined as 19-33, 34-37, 38-44 and >44 . Overall, the absolute risk of major complications increased from 2.5% in the lowest BMI strata to 3.7% in the highest BMI strata. Compared to patients with a BMI between 19-31, the odds of sustaining a major complication increased by 1.1, 1.2 and 1.5 for patients in each higher BMI strata (all, $p < 0.05$).

DISCUSSION AND CONCLUSION:

We have identified BMI thresholds which classify 30-day major complication risk following TKA using a large, national cohort of patients over the past 10 years of data. Patients in our highest BMI threshold had only a 1.5 times greater adjusted odds of 30-day major complications compared to the lowest BMI group.