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Paper #1

Risk Factors for Early Revision of Total Knee Arthroplasty

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Summary:
The projected growth in utilization of total knee arthroplasty (TKA) will create an increasing need for revision TKA. An in-depth understanding of the risk factors for early revision TKA is needed to minimize the tremendous cost, morbidity, and technical challenges associated with revision surgery.

Abstract:
Background:
The projected growth in utilization of total knee arthroplasty (TKA) will create an increasing need for revision TKA. An in-depth understanding of the risk factors for early revision TKA is needed to minimize the tremendous cost, morbidity, and technical challenges associated with revision surgery.

Methods:
An index cohort of 304,157 patients who underwent primary TKA in New York or California from 1997-2005 was generated from statewide administrative databases. Unique patient identifier codes were used to determine whether they underwent revision TKA (as determined by ICD9 codes) during the study period. Patient characteristics (age, sex, comorbidities, insurance type), community factors (education level, poverty level, median household income, population density), and hospital characteristics (annual hospital TKA volume, number of hospital beds, hospital teaching status) were analyzed using univariate statistics and multivariable regression modeling to determine predictors for early revision TKA.

Results:
Early revision (<10 years from index arthroplasty) occurred in 9,829 (3.3%) TKA patients. Younger age is a risk factor for early TKA revision, with patients under 50 years of age having a 53% higher risk of undergoing early revision than patients between 50-75 years of age ($p<0.001$). Men were 18% more likely than women to undergo early revision TKA ($p<0.001$). Medicare recipients were 18% less likely to undergo early revision TKA ($p<0.001$), even after adjustment for age and comorbidity. Patients from communities with the highest education level (9% increased risk; $p=0.01$) and the most poverty-stricken communities (8% increased risk; $p=0.02$) had modest, but significant, increases in risk of revision TKA. Mid-volume hospitals (200-400 annual cases) had a 9% reduction in the risk of undergoing revision compared to hospitals performing <200 cases annually.

Discussion:
We identified a number of risk factors, including younger age, male sex, insurance status, community socioeconomic status, and low hospital procedure volume, for early revision TKA. Given that the expected survivorship of modern implants exceeds 20 years, revision TKA within 10 years of the index procedure is a sub-optimal outcome. Strategies to mitigate the impact of these risk factors on the occurrence of early revision TKA could lead to improved patient care and decreased health care costs.