Risk Factors for Increased Hospital Cost for Primary Total Knee Arthroplasty

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INTRODUCTION: Patients with more complex medical comorbidities increase the cost of primary total knee arthroplasty (TKA). The goal of this study is to evaluate and quantify the impact of medical comorbidities on the cost of primary TKA.

METHODS:

Hospital billing data for 3,077 primary total knee arthroplasty (CPT 27447) from January 2017 to March 2020 at a high-volume academic medical center in an urban setting was retrospectively reviewed. Patient demographics, comorbidities, and admission data were collected. Univariate and multivariate gamma regression analyses were performed to identify associations with increased cost during primary TKA admissions.

RESULTS: The median cost of primary TKA was $32,129. Initial covariate analysis showed risk factors for increased total cost of primary TKA include BMI ≥ 35 ($33,078 vs. $31,678, P <0.001), ASA score of 3-4 ($33,027 vs. $31,326, P <0.001), diabetes ($32,635 vs. $31,922, P <0.001), HIV-AIDS ($35,391 vs. $32,228, P <0.001), congestive heart failure ($35,101 vs. $32,087, P <0.001), chronic pulmonary disease ($32,912 vs. $32,098, P = 0.001), and renal disease ($33,058 vs. $31,911, P <0.001). Total cost was found to increase with increasing Charleson Comorbidity Index (CCI) scores ($31,545 for CCI = 0 vs. $35,099 for CCI scores of 5 or more). Multivariate gamma regression identified BMI ≥ 35 (relative risk (RR) = 1.03), ASA score of 3-4 (RR = 1.03), diabetes (RR = 1.01), congestive heart failure (RR = 1.12), and mild liver disease (RR = 1.05) as independent risk factors responsible for increased cost in primary TKA.

DISCUSSION AND CONCLUSION: BMI ≥ 35, ASA 3-4, diabetes, CHF, and mild liver disease were independent risk factors for increased cost during the index hospitalization for a primary TKA. The cost of primary TKA increased as CCI increased.