

Public Reporting of Prosthetic Joint Infections: Do Claims Based Comorbidities Adequately Capture Case-Mix?

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Introduction: Surgical site infections, including prosthetic joint infections (PJI), are hospital quality measures and will soon be subject to public reporting and part of CMS value-based purchasing criteria. The predictive value of the comorbidity-based models ascertained from claims data has never been tested against clinically-derived PJI risk models. The purpose of this study is to assess the prognostic value of comorbid conditions (based on ICD-9 codes) relative to clinically-derived PJI risk factor data.

Methods: The study included 21941 THA and TKA procedures performed at a large US tertiary care hospital between 1/1/2002 and 12/31/2009. Revision procedures for infections were excluded. Data elements were ascertained through the institutional joint registry, electronic medical records and administrative records. Comorbidity data reflecting all documented clinical diagnoses were retrieved. Clinical PJI risk factors included body mass index, surgery type, indications for surgery, prior surgeries on the index joint, ASA score, anesthesia type, procedure duration, and selected labs and medications. Significant obesity was defined as BMI >40kg/m². All cases of PJI were reviewed manually to validate PJI diagnosis, and PJI outcome was limited to definite cases.

Results: Selected comorbidities were individually associated with a higher risk of PJI, including heart failure (HR 2.1, 95% CI 1.5, 2.9), pulmonary disease (HR 1.5, 95% CI 1.1, 2.0), diabetes (HR 1.8, 95% CI 1.3, 2.3), renal disease (HR 2.4, 95% CI 1.8, 3.3) and rheumatological diseases (HR 1.9, 95% CI 1.3, 2.7). Based on a multivariable model that included a total of 7 comorbidities along with age, sex, obesity and a history of prior TJA, resulted in a c-statistic of 0.682, and was comparable to a clinically derived risk model (0.695).

Conclusions: Our findings support the value of using comorbidity-based risk stratification measures in capturing case-mix across hospitals when evaluating PJI. If used in the clinical setting, the model performance might be improved further with the inclusion of additional clinical data elements.

