Does the American Joint Replacement Registry Correctly Classify Diagnoses in Aseptic Revision Total Hip Arthroplasty?

Nicholas Bedard[1], Jacob Michael Wilson, Samuel Broida, Hilal Maradit-Kremers[1], James Andrew Browne, Bryan Donald Springer[2], Daniel J Berry[1], David G Lewallen[1]
[1]Mayo Clinic, [2]Orthocarolina

INTRODUCTION: The American Joint Replacement Registry (AJRR) utilizes International Classification of Diseases-10 (ICD-10) codes to record surgical diagnoses for revision total hip arthroplasty (rTHA) procedures. The validity of using ICD-10 data in this manner is not known. The purpose of this study was to determine the accuracy with which AJRR submitted data correctly classifies aseptic rTHA diagnoses in cases of instability, loosening, and periprosthetic fracture.

METHODS: A total of 787 aseptic rTHAs performed at a single institution from 2015-2021 were included. True revision diagnosis was determined by our institutional total joint registry which uses trained abstractors to prospectively record surgical diagnosis independent from ICD-10 billing. Submitted AJRR diagnosis data was retrieved for the same rTHA procedures. Concordance between institutional registry data and submitted AJRR ICD-10 diagnosis codes for instability, loosening, or periprosthetic fracture were examined using three different measures of concordance: sensitivity, positive predictive value (PPV), and Cohen's Kappa statistic.

RESULTS: Concordance between our institutional database and AJRR submitted ICD-10 data varied from very good for instability (k=0.76*)* and loosening (k=0.67*)* to moderate for periprosthetic fracture (k=0.54). The percent agreement for instability, loosening, and periprosthetic fracture between databases was 94%, 85%, and 96%, respectively. PPVs were 86%, 93%, and 78%, for instability, loosening, and periprosthetic fracture, respectively. Specificity was high (>96%) for all three diagnoses but sensitivity was substantially lower at 74%, 68%, and 44% for instability, loosening, and periprosthetic fracture, respectively.

DISCUSSION AND CONCLUSION: AJRR submitted ICD-10 data correctly classifies a high percentage of diagnoses in rTHA performed for instability, loosening, and periprosthetic fracture. Reassuringly, the specificity of AJRR diagnoses was high. However, the accuracy varies by diagnosis and was lowest for periprosthetic fracture. These data demonstrate the potential for diagnosis specific limitations when utilizing ICD-10 administrative claims for registry reporting and given low sensitivities, suggest utilizing such methodology may underreport particular diagnoses.