Comparing the American Joint Replacement Registry to the Centers for Medicare and Medicaid Services database: How Specific and Sensitive is the AJRR to CMS when Evaluating New Technology Use in Total Knee Arthroplasty?

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INTRODUCTION:

There has been an associated increase in researchers using large datasets to try to study new technology use in performing total knee arthroplasty (TKA). Large administrative databases (such as Medicare) as well as clinical registries (such as the American Joint Replacement Registry, AJRR) have been recently employed for this purpose. However, due to the inherent limitations of these databases, it remains unclear whether or not use of these data sources is a valid and accurate way to study this topic.

METHODS:

All primary TKA cases aged 65 and over from January 1st, 2017 to December 31st, 2022 submitted to AJRR as of March 2024 (n=330,270) were included. Patients with AJRR data were matched to their record in the Medicare dataset and queried using robotic or computer navigation ICD-10 and CPT procedure codes. Concordance rates for technology use were determined, and estimates for specificity and sensitivity were calculated. Cases with unidentifiable laterality in CMS were excluded.

RESULTS:

There were a total of 330,270 patients in the AJRR dataset who underwent a primary elective TKA and were Medicare eligible. Using CMS as the reference standard, the sensitivity of AJRR to correctly classify procedures as having used technology was 44.9% (43.86,45.93) and the specificity for correctly classifying non-technology cases was 93.8% (93.71,93.88). The overall percentage of cases where AJRR and CMS agreed on technology status was 92.5% (92.39, 92.57) (n=305,426).

DISCUSSION AND CONCLUSION:

There is substantial discordance between large datasets when looking at the use of new technologies in TKA. Our results suggest that AJRR is more accurate in identifying when technology is not used rather than when technology is applied, compared to the same cases in CMS. Care should be taken when using large data sets when attempting to analyze the use of technology in TKA, especially when assuming technology is used.