Infection burden in total hip and knee arthroplasty: an international registry based perspective

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Introduction

- Periprosthetic joint infection (PJI) remains a leading cause of failure of primary total hip arthroplasty (THA) and total knee arthroplasty (TKA).
- A major outcome tracked in joint registries is surgical revision, subcategorized by cause.
- To compare infection-related revision across different national registries, the concept of infection burden was utilized.
  - Infection Burden:
    - The ratio of implants revised for infection to the total number of arthroplasties performed in a specific time period.
    - Measures the steady state of relative number of infection cases in registries worldwide.

Hypothesis

We hypothesized that infection burden would be similar across multiple national arthroplasty registries.

Material and Methods

- Registries included in analysis:
  - American Joint Replacement Registry (AJRR)
  - Australian Orthopaedic Association National Joint Replacement Registry (AOANJRR)
  - New Zealand Joint Registry (NZJR)
  - Swedish Hip Arthroplasty Register (SHAR)
  - Swedish Knee Arthroplasty Register (SKAR)
  - National Joint Registry of England, Wales, Northern Ireland, and the Isle of Man (NJR)
- Infection burden for both hip and knee arthroplasty was calculated from publicly reported or from reported data (e.g., registries' Annual Reports) of each registry for the last six years or since registry inception.
  - An infection-related revision or removal of components was based on the specific criteria and definitions of revision used by each individual registry and met our defined parameters.
  - We counted a revision or removal of components for infection only once for a given infection episode when multiple subsequent procedures were carried out on the same joint.
  - Unweighted averages were used for overall comparison:
    - That is, the overall volume of arthroplasties in a given health system was not taken into account for the aggregate totals – each health system was given equal weight.

Results

Contemporary hip infection burden, in percent

Registry	2010	2011	2012	2013	2014	2015
AJRR	NA	NA	NA	NA	0.99	0.91
AOANJRR	0.80	0.78	0.85	NA*	0.82*	0.76*
NZJR	0.64	0.59	0.56	0.75	0.70	1.00
SHAR	0.88	1.12	1.14	1.18	1.30	1.24
NJR	0.84	0.86	0.91	0.85	0.91	0.94
Unweighted Average	**0.79**	**0.84**	**0.87**	**0.93**	**0.94**	**0.97**

*AOANJRR analysis excluded data for metal-on-metal THA with a head ≥32 mm for 2013, 2014, and 2015

Contemporary knee infection burden, in percent

Registry	2010	2011	2012	2013	2014	2015
AJRR	NA	NA	NA	NA	0.95	0.85
AOANJRR	0.87	0.80	0.89	1.08	0.98	0.88
NZJR	0.64	0.71	1.05	1.07	1.10	1.20
SKAR	1.11	1.22	1.27	1.35	1.11	1.28
NJR	0.91	0.94	0.96	0.94	0.97	0.94
Unweighted Average	**0.88**	**0.92**	**1.04**	**1.11**	**1.02**	**1.03**

For both hip and knee arthroplasty, each registry with six-year data showed an increase infection burden over the period of the survey.

Discussion

Infection burden is defined as the number of joint replacement revisions performed for a diagnosis of infection divided by all revision and primary total joint arthroplasties in a given time period (one year in our analysis). For both revision THA and revision TKA, the burden of infection has increased over a six-year period. Despite efforts to optimize patients and improve preventive measures, we did not observe a decline in the infection burden across six international registries, but instead saw a steady increase for both infected THA and TKA. PJI remains one of the most frequent modes to failure in total joint arthroplasty worldwide.

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