EDITORIAL

Can National Joint Registries play a role in improving our understanding of periprosthetic infections?

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Whilst there is agreement of the challenges periprosthetic infections (PPI) pose for our community, there is little agreement about its true incidence, and far too little concordance in the way that we manage it and document its course and outcome. Despite an attempt to find a consensus for the surgical management of PPI, the application of those principles is hampered by inconsistencies in the diagnosis and surveillance of PPI between institutions. This has resulted in a lack of certainty regarding patient selection and treatment algorithms, as we lack a clear understanding of the ‘ideal candidate’ for each treatment modality. On the whole, the outcome remains generally poor, and many questions remain unanswered.

In an attempt to clarify the definition, the Centres for Disease Control in the United States defines a PPI as meeting three out of four subjective criteria.1 This has proven to be unreliable, and has been modified by the Nosocomial Infection National Surveillance Scheme in the United Kingdom.2 Similarly, this definition has had poor uptake as the interpretation varies widely between individual hospitals and regions. The most recent attempt by the Musculoskeletal Infection Society3 aims to develop a standardised definition to improve comparisons between studies, and the quality of the published studies.

In truth, without a consensus regarding the definition, we do not know the true incidence of PPI. It is likely to be underestimated by our current methods of data capture, which are largely based upon single centre cohort studies, many of which are from specialist centres with high-volume surgeons operating upon selected patients. Furthermore, poor surveillance of post-operative complications, inadequate length of follow-up, and poor documentation may further hinder our understanding of the incidence and prevalence.4

National joint registries provide a funded and pre-existing logical solution to solving the current deficiencies in PPI surveillance and surgical management. However, if we were to rely upon these today, we would be disappointed. The National Joint Registry for England, Wales and Northern Ireland (NJR)5 and European registries were not designed to capture specific information relating to infections. The latter requires many more detailed and verified information, if we were to pursue such a path. Multiple attempts to integrate or compare joint registry data with other registries have confirmed incomplete capture.6-8

The validity of data obtained by national registries has often come into question at both a local and national level. Using the Norwegian Arthroplasty Register, a single Institute identified 0.4% of cases had not been reported, and data completeness was poorer for revisions (1.2%) than for primary operations (0.2%),9 whereas on a national level only 76% of revision hip and 62% revision knee procedures were reported.10 More recently, the validity of the NJR was compared with records from the London Implant Retrieval Centre, with 39.1% of retrieved implants not correctly registered in the NJR over a ten-year period.6

Specifically for infection, data for re-operation in the Swedish Hip Arthroplasty register was matched to a prescribed drug register, and demonstrated only two thirds of cases re-operated for infection were reported.11 Furthermore, a review of the Danish registry highlighted a 40% discrepancy in infection rates following hip arthroplasty, when compared with a combination of sources (microbiological, prescription and clinical biochemistry databases, and clinical findings), which was significantly higher.7,12

The NJR captures infection as an indication for revision procedures, and only includes single, two-stage, and excision arthroplasty for hips, knees and shoulders, and includes amputation for ankle revision. Often, the diagnosis of infection is based upon the surgeon perception at time of revision, without microbiological evidence. Other procedures relating to infections are excluded, such as wound washouts and...
debridement with implant retention. Therefore, information about PPI management, or the prevalence of infection is not fully captured.

In an ideal world, interested institutions, and ultimately all reporting hospitals and Trusts, would enter a larger dataset for all infected cases. This was first mooted in the BJJ in 2013, and based on discussions with Henrik Malchau, Keith Tucker and others with a grasp of the unrealised potential of national registers. Adapted to include information specific to infections, significant amounts of multi-institutional and multidisciplinary data could become available within registries. All procedures relating to infected cases should be included (such as wound washouts, debridement and implant retention, and aspirations under anaesthesia), and incorporate specific information such as patient factors; quality of soft tissue (e.g., presence of sinus); degree of bone loss; pre-operative status and comorbidities; operative factors; site of infection within the surgical field (e.g., acetabulum, femur, tibia); pathogen factors; microbiological results (pre- and post-operative); antibiotic sensitivities and duration of antibiotic therapy.

This new information would help to shed light on the risk associated with certain patient groups and with specific procedures for a particular condition, and improve our surveillance. Furthermore, it will allow surgeon- and hospital-specific data to be reviewed in light of the complexity of their patient cohort, not appreciated by current NJR data. At the hospital level, outcomes may be used to rank departments, and demonstrate whether or not patients treated at specialist centres have fewer complications and better outcomes.

Current data regarding PPI may lead to unfounded, inaccurate conclusions, and we have an overwhelming need for high-quality data to further our understanding. The use of national registries is an innovative way to capture local and national observational data. Notwithstanding the known limitations of National Joint Registries, the introduction of specific infection data will not only increase our confidence in the NJR, as it will hold critical information we require to accurately interpret national PPI management. Such a move has the potential to improve the international management of PPI as other countries harmonise their data collection with ours, and start to expand the dataset. This, of course, would be an adjunct and not a substitute, for the multicentre randomised clinical studies that are also needed in this area.

Introducing additional questions to established forms, or creating a separate form, may be seen as a hindrance to some clinicians. Other limitations may be a lack of consensus regarding the diagnostic criteria for PPI, an absence of political backing, financial implications, poor compliance, and an ability to validate the findings. However, we believe the potential benefits from a small change in practice could be significant, and should be strongly considered.

References


