EDITORIAL (BY INVITATION)

Towards a multi-source assessment of outcome data in spine surgery

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Surgery for lumbar spinal stenosis is common. Understanding the associated complications is crucial for patient discussion. It is also important for audit and quality improvement purposes as our patient population ages and different surgical approaches are adopted [5]. Alongside surgical advances, it is our responsibility as surgeons to advance our methods for measuring patient outcomes. These outcomes must include clinical events as well as measures relevant to patient experiences. Increasingly, patient-reported outcomes form a core part of outcome assessment [2, 4]. Health services can also leverage routine healthcare data and systematic patient-reported outcomes to generate the volume and veracity of data to inform clinical management.

In this issue of *Acta Neurochirurgica*, Alhaug et al. reported data on postoperative complications after surgery for lumbar spinal stenosis in 327 patients using two different methods in Norway [1]. One method used patient-reported outcomes via a prospective registry (NORspine), and another involved reviewing electronic patient records (EPR) to determine complications. Although both methods yielded similar complication rates (NORspine 15.6%, EPR 16%), the combined proportion of patients with a complication was 22.4%. This represented non-overlapping reporting of complications between patients and clinicians. Alhaug et al. showed that patients reported more micturition problems and urinary tract infections compared to clinicians.

This study raises some interesting points about quantifying complications. NORspine relied on patients reporting complications. There are participant and reporting biases with this mechanism. However, outcome ascertainment by clinicians reviewing EPR is labour-intensive. Clinicians are only limited to the health records available to them; primary care or hospital records outside the surgical centre may not be available. While both methods have their limitations, results from this study suggest improved data veracity on postoperative complications using overlapping sources and methods.

Findings from this study demonstrate that data from different registries may not be directly comparable. There are several registries set up for spinal surgery, each has its procedures for data ascertainment. These procedures may introduce differential bias if comparisons are made. With the increase in interest and expertise in applied artificial intelligence in healthcare, data harmonisation between these registries can facilitate the best use of data to monitor patient outcomes.

A perspective provided by this study is that clinical information alone may not be the best data source for answering patient-centred research questions. Retrospective studies using routinely collected clinical data are common. One of the prevalent criticisms of this methodology is that relevant data may not be captured by design. Alhaug et al. provided a real-world example of how data from EPR alone underestimates the prevalence of postoperative micturition problems in patients after surgery for lumbar spinal stenosis [1].

The difference between patient- and clinician-reported data is known and shown in our study of cauda equina syndrome [7]. For research studies addressing clinical questions about the association between an intervention and outcome, specific patient-reported outcomes must be obtained with a high response rate. Preparedness of registry data for real-world analyses can be enhanced with the integration of patient-reported outcomes, such as that in Alhaug et al.'s study. The practicality of minimising attrition and availability bias is an important area of optimisation.

Following our editorial on using routine healthcare data for postoperative adverse events [6], it is clear that our community continues to be interested in finding the best way of obtaining data [8]. The efforts towards consistent and comparable data-capturing methods will continue. Success in these efforts requires teams of surgeons, epidemiologists,

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data scientists, computer scientists, health informaticians, and patient representatives. Alhaug et al.'s study provides a helpful contribution to the understanding of mechanisms to capture clinical information [1]; and supports the use of overlapping data sources for quantifying postoperative complications after spinal surgery.

Declarations

Conflict of interests Authors declare no conflict of interests.

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