
Total knee arthroplasty (TKA) is a highly successful and cost-effective procedure providing substantial improvements in pain, functional disability and health-related quality of life [1]. The lifetime risk of undergoing a TKA is estimated to be 10.8% for women and 8.1% for men [2]. It is an increasingly common surgical procedure, as >80,000 operations are now performed annually in the UK, and these numbers are expected to increase in the future as the population ages and levels of obesity increase.

It is already well known that not all patients have a good outcome following surgery and there are a minority of patients who do not have symptomatic improvement following joint arthroplasty, with estimates ranging up to 30% [3]. A recent systematic review reported unfavourable long-term pain outcomes in ~20% of patients after TKA [4]. Data on a large cohort of patients receiving primary and revision TKA from the Mayo Clinic Total Joint Registry presented by Singh and Lewallen [5] add to this evidence base for primary operations and provide new information in relation to revision surgery. At 2 years after primary TKA 7.5% of patients had moderate to severe pain, compared with 24% of revision TKA patients. Regarding overall activity limitations, 19% of primary TKA patients with moderate to severe activity limitations had no change in symptoms at 2 years post-surgery, with a further 3% getting worse (developed moderate to severe limitation but had no or mild limitation pre-operatively), with the respective figures for revision TKA being 32% and 9%. There was little change in these proportions between the 2- and 5-year follow-ups for both pain and functional outcomes. The data demonstrate that the outcomes of revision surgery are less successful than the primary procedure, particularly in relation to post-operative pain.

The estimates of the proportions of patients suffering from persistent pain and functional limitations presented by Singh and Lewallen [5] would suggest a more favourable outcome compared with those given in the existing literature where much higher estimates have been previously published. There are several reasons for this. The response rates at 5 years were 48% and 57% [5], with evidence suggesting that non-responders were more likely to have a worse outcome and, as such, these results are likely to underestimate the true proportion of patients with persistent symptoms. Many of the questions used to record knee pain and self-reported limitations in activities of daily living have limited validity and do not represent clinically important outcomes. As an example, a high proportion of patients will report they are either satisfied with the outcome of joint replacement surgery or consider they experienced an important improvement, yet when this response is anchored against a validated patient reported outcome such as the WOMAC or Oxford Knee Score, the proportion achieving a clinically important outcome tends to be lower [6]. Second, the severity of pre-operative symptoms in this cohort [5] was much higher than would be expected, where 96% of patients of primary TKA had moderate to severe pre-operative pain, with only 4% having no or mild pain (for revision TKA, 74.5% had moderate to severe pain pre-operatively). Pre-operative symptoms of pain and function have been shown to be normally distributed in cohorts of patients from the UK and Europe [6] and in data from the UK national Patient Reported Outcome Measures (PROMs) programme. Hence the estimates presented in this study may not be generalizable to patients with milder pain and functional limitations prior to surgery.

Although this information will be helpful for patients and clinicians to make an informed decision about surgery by setting realistic expectations of the likely improvements, it is only the first step in this process. These data [5] describe the average percentage of patients obtaining improvements following surgery. However, to truly inform patient-clinician decision making, the risk and benefits of surgery need to be individualized to the patient, based on their own characteristics. This would allow the patient to understand their individual chance of success rather than an average measure of success. This personalized medicine requires a risk prediction tool that takes account of the many other factors that are known to influence patient-reported outcomes of joint replacement surgery, including pre-operative disease severity, radiographic grade of disease, obesity, co-morbidities and mental health. Examples of such decision-making tools exist within the literature [7, 8] and there is a need for development and external validation of such tools in larger cohorts of patients undergoing joint arthroplasty.

In comparison to primary knee arthroplasty, the risk factors associated with good or poor outcomes of revision arthroplasty are not so well understood. Few observational cohorts exist in which to investigate this, with this cohort from the Mayo Clinic Total Joint Registry dataset [5] being one of the largest available. The existing literature suggests that the influence of predictive variables, including age, gender, co-morbidities and obesity, does not differ between those having primary and revision surgery. Decision making in knee arthroplasty

Informing patient expectations of the likely success of surgery
surgery [9, 10]. The findings of this study [5] add to this evidence base in suggesting the outcomes of revision surgery are much less successful than for primary surgery. There is a clear need for the development of decision-making tools to assist patients and clinicians in personalized risk prediction of the likely outcome of arthroplasty and to enable patients to set realistic expectations, with a need to translate risk prediction tools for suitability of use in both primary and revision arthroplasty patients.

Disclosure statement: A.J. has received honorariums, held advisory board positions (which involved the receipt of fees) and received consortium research grants from Roche, Anthera and Servier, respectively. N.K.A. has received honorariums, held advisory board positions (which involved the receipt of fees) and received consortium research grants from Merck, Merck Sharp and Dohme, Roche, Novartis, Smith and Nephew, Q-MED, Nicox, Servier, GlaxoSmithKline, Schering-Plough, Pfizer and Rottapharm.

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Accepted 30 August 2013

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