ESTIMATING THE LIFETIME RISK OF TOTAL HIP AND KNEE REPLACEMENT IN THE UNITED KINGDOM

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Purpose: Establishing a population-based estimate for the lifetime risk of total hip and knee replacement (THR/TKR) is an important epidemiological development which will assist health service planners in assessing the future burden of lower limb arthroplasty.

Methods: We used data from the U.K. General Practice Research Database (GPRD) which contains all the computerised records of 6.25m patients, and is representative of the population of the U.K. We collected data on all THRs and TKRs performed between 1991 and 2006, a total of over 27,000 THRs and 24,000 TKRs. We calculated incidence rates for THR/TKR under a Poisson model and combined these rates with mortality rates from the U.K Office for National Statistics (ONS) using a life-table framework. These estimates were then aggregated to produce a simple lifetime risk of THR and TKR by gender for age 50 and above. We also calculated the temporal trend in lifetime risk at age 50 by single calendar year from 1991 to 2006.

Results: We estimated that at age 50 the mortality-adjusted lifetime risk of THR was 7.80% for females and 5.05% for males (TKR: 6.66% and 5.04% respectively). The risks of THR for females aged 50 was 54% greater for than for males (32% greater for TKR). The risk percentage decreases with increasing age for both THR and TKR in males and females. At age 80 the gender gap in risk of THR remains in favour of females (53% higher) but in TKR it is two-thirds of that at age 50 (females 21% higher). Between 1991 and 2006, the lifetime risk of THR rose from 3.89% to 10.41% for females and for males from 3.43% to 6.34%. Over the same period, for TKR the risk for females increased from 2.78% to 10.02% and for males from 3.43% to 6.34%. A cemented Exeter femoral component (Stryker Howmedica Osteonics, Mahwah, New Jersey) was used in all cases with a number of different acetabular components. Patient demographics included age, gender, body mass index (BMI), occupation, analgesic use, co-morbidities, fixed flexion, SF36 mental health score. Intra-operative variables were operator grade, surgical approach, patient position, lavage system, cement pressurisation, type of cement, polyethylene and femoral head, femoral head size, femoral component size, duration of operation. Outcomes are defined as: a) post-operative Oxford Hip Scores (OHS); b) Patient Acceptable Symptom State (PASS) anchoring post-operative OHS on satisfaction with surgery. Repeated measures regression modelling is used to identify patient and surgical predictors of outcome. Multiple imputation methods were used to handle missing data, and bootstrap backward variable deletion to select variables included in final models.

Results: The majority of patients initially demonstrated substantial improvement in symptoms as measured by OHS with little further improvement after one year (Figure 1). The strongest determinant of outcome was the baseline OHS (p<0.001), where patients with worse pre-operative pain/function had worse post-operative pain/function. Older age (p=0.053), increasing BMI (p=0.003), more co-morbidities (p<0.001), and worse mental health (p<0.001), were associated with worse outcomes. Patients with larger femoral component size (offset of 44 or more) had better outcomes (p=0.003). Assessing the discriminatory ability of the model: (a) baseline OHS explained 10.3% of the variability in outcome, (b) baseline OHS + patient variables 14.7%, (c) baseline OHS + surgical 10.7%, (d) baseline OHS + patient + surgical 15.2%. Using the PASS score, predictors of a successful outcome were the same except the PASS score continued to improve over time.

Conclusions: Using a simple method of aggregating mortality-adjusted, population-based incidence rates within a life-table, we have provided estimated lifetime risks of undergoing a THR/TKR in the U.K. from middle-age onwards. The lifetime risk at age 50 is only slightly more than at age 60, but this drops considerably at ages 70 and 80. The size of our estimates for lifetime THR and TKR risk at age 50 (between 5 and 8%) contrasts strongly with the relatively high level of lifetime risk at age 18 for osteoarthritis (OA) of the knee (40–50%) and the hip (25%) as seen in the United States. This difference between the lifetime risks of an established intervention (THR/TKR) and one of its main indications (OA) warrants further investigation.

IDENTIFYING PREDICTORS OF PATIENT REPORTED OUTCOMES OF PRIMARY HIP REPLACEMENT SURGERY: A MULTI-CENTRE POPULATION BASED COHORT STUDY

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Purpose: While Total Hip Replacement (THR) is regarded as an effective procedure to reduce pain and disability, it is now recognized that a minority of patients do not improve. The aim of this study was to identify patient characteristics and intra-operative surgical variables associated with good patient reported outcomes after THR.

Methods: The Exeter Primary Outcomes Study (EPOS) is a prospective multi-centre study of 1375 patients (1431 hips) receiving primary THR for osteoarthritis. A cemented Exeter femoral component (Stryker Howmedica Osteonics, Mahwah, New Jersey) was used in all cases with
Outcomes Following Total Knee Replacement Surgery for OA: There Is More Than Just the Knee to Consider


Purpose: The most common outcomes examined in total knee replacement (TKR) for osteoarthritis (OA) are pain and physical function. And, TKR is an effective treatment for relieving pain and improving function. While people with OA often have multiple symptomatic joints, however, the impact of this on these TKR outcomes has received little attention. This work evaluated whether the occurrence and location of symptomatic joints predicted change in WOMAC pain and physical function following TKR, and whether multiple joint involvement was associated with the likelihood of achieving a minimally clinically important difference (MCID) in physical function. The influence of multiple joint involvement on a number of additional TKR outcomes was also examined.

Methods: Participants (n=494) completed pain and physical function measures (WOMAC, KOOS which subsumes the WO MAC) and CPG, sports/recreation (KOS), fatigue (POMS), and anxiety and depression (HADS) pre surgery and at 12 months post surgery. Comorbidity was based on number of conditions. Symptomatic joints were indicated on a homunculus based on pain or discomfort on most days of the previous month. Symptomatic joints were separately considered as a summative count and by joint site as an independent predictor of change in WOMAC pain and function by way of regression analyses, adjusting for covariates: age, sex, BMI, comorbidity, and baseline status for each measure. Logistic regression analyses examined the effect of joint involvement (count and site) on MCID on WOMAC pain and function adjusted for covariates. Finally, the effect of joint involvement on change in the other outcomes was also examined.

Results: Ages ranged from 35–88 years (mean = 65) with 65% female. 15% of the sample was symptomatic in only their surgical joint; 46% reported ≥5 symptomatic joints. Mean change scores across all measures varied depending on whether specific joint sites were indicated. The least amount of change was observed among participants reporting feet/ankle and neck as problematic joints. This was confirmed in regression analyses. Adjusting for covariates and all joint sites, individuals reporting neck problems had less change across all measures (p range: 0.0020–0.1542), except KOOS sport/recre. Individuals reporting feet/ankle also had less change across measures (p range: 0.0002–0.0136), except fatigue and anxiety. For fatigue, back problems were also associated with less change.

Conclusions: This study provides a comprehensive assessment of a wide range of potential patient and surgical predictors associated with outcomes of THR and the results will be useful to inform decision making. A strength of this study is the large sample, repeated measures of outcome over 5-years, and comprehensive internal validation of prognostic models using multiple imputation and bootstrapping methods. Although we identified a number of significant predictors of outcome, most of the difference in outcomes were predicted by the baseline OHS, with little effect of other patient and surgical factors. These patient groups still receiving substantial benefit from surgery, for example both obese and non obese groups receive great improvement, even though there are small differences in pain/function at outcome (Figure 2). Better measures of existing predictive variables, and other factors, need to be identified that explain a greater proportion of the variability in outcome to support patients and clinicians in making a decision about surgery.

Use and Costs of Pharmacologic and Alternative Treatments in Patients with Osteoarthritis in Community Based Settings in the United States

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Purpose: Arthritis is one of the most common chronic conditions affecting 15%-20% of the population. Estimates from population surveys show a further 10%-15% of the population reporting chronic joint symptoms (CJS). CJS have been considered as an indication of possible arthritis with studies showing conflicting results. Most of these studies have compared individuals with CJS to those with arthritis in terms of their predictors and only a minority have considered health-related outcomes. This study examines predictors and health outcomes for individuals with