Health status after hip or knee arthroplasty

C Jinks, M Lewis, P Croft

After hip and knee arthroplasty pain and disability still remain higher than in the general population

Hip and knee problems are a major cause of pain and disability. Although only a minority of sufferers—those with severe symptoms and disability in association with radiographic osteoarthritis—will be candidates for surgery, this still means that in America, for example, 400 000 primary hip and knee arthroplasties are performed each year,¹ and the demand is increasing.² Randomised controlled trials of arthroplasty versus other treatments have not generally been performed, but total hip arthroplasty and total knee arthroplasty procedures are perceived by the public and by health professionals to be largely successful. Follow up studies have confirmed that postoperative levels of pain and disability are consistently lower than preoperative levels.³⁻⁷ However a number of small studies have also shown that, despite significant postoperative improvements, levels of pain and disability are higher in those who have undergone arthroplasty than in controls in the general population.⁸⁻¹¹ A large interview based study, carried out in France by Boutron and colleagues and reported in this issue of the *Annals*, has now confirmed this finding.¹²

Interview based study

This new study was undertaken on the back of the French national census. Nearly 17 000 people were interviewed. The authors found that those with previous arthroplasty had persistent difficulties with physical functioning. After adjusting their analysis for age, sex, and a number of other chronic conditions, the group with hip and knee arthroplasty were more likely than those in the general population to have continuing lower limb disabilities (including self care, housekeeping, and mobility difficulties). The broad differences between the arthroplasty group and the general population cannot exclude the possibility that the actual contrasts lie in subgroups of the arthroplasty population. A higher proportion of patients with total hip arthroplasty report improvements than those with total knee arthroplasty, for example,⁷ and the authors of the

French study note in their discussion that it may be those with a total knee arthroplasty who selectively have persistent problems. In addition, patients with arthroplasties vary in their preoperative health status and this may affect postoperative outcomes. Fortin and colleagues¹³ reported that in patients with lower preoperative levels of physical function, neither pain nor physical function improved postoperatively to the level achieved by those with higher preoperative function. This difference was most marked in patients undergoing total knee arthroplasty. In their multivariate analysis, the preoperative physical functioning scores (on both joint-specific and generic scales) were the most important predictors of outcome scores on the same scales six months after total hip or knee arthroplasty.

"More patients with total hip arthroplasty report improvements than those with total knee arthroplasty"

However, the central finding from the French study is clear—overall function levels in people who have undergone hip and knee arthroplasty remain lower than in the rest of the population. One implication of this concerns patient expectation. People awaiting arthroplasty may have the impression that the pain and stiffness resulting from their hip or knee osteoarthritis are going to be transformed by this operation, and superficially there is no particular reason why such patients should not be restored to full activity and a pain-free existence. The French study, at one level, is an investigation of this expectation—that is, is this group restored to normal functioning after arthroplasty? The answer to this question is no, and in order to deal with the potential additional healthcare needs, both before and after arthroplasty, of patients considered suitable for this operation, we must reflect on possible reasons for this.

Why is normal physical functioning not restored?

On first reflection, the findings from the study of Boutron *et al* seem hardly

surprising. Total hip and total knee arthroplasties are being undertaken on a more disabled group of the population, and even if this group all improved considerably after their operation, they may still represent a relatively disabled group compared with the majority. Thus expectations of a full recovery may be misplaced.

A second point is that the operations will not be successful for everyone, in particular because of failure of the prosthesis or of the implant procedure. The risk of a revision operation is reported as 1% a year.¹⁴ This represents another challenge to patient expectations of full recovery and in effect makes the arthroplasty group at continuing increased risk of deteriorating pain and disability compared with the general population. Because the French study does not give us details of the time since the operation in relation to current levels of pain and disability, it is not clear how important an influence this might be on their results.

Patients report that most of their improvement occurs within the first three months after the operation,¹¹ and so it is likely that a cross sectional survey such as that of Boutron *et al* will correctly reflect the general outcome of surgery in the population as a whole. However, the timing of surgery, in the context of the disease course and progression, may also be important. Fortin *et al* note that if surgery is done late, then its benefits may be reduced owing to muscle deconditioning, loss of mobility, and lack of exercise.¹³ This might explain some of the variation seen in the French study.

Hip and knee osteoarthritis: chronic regional pain syndromes

Although the results of hip and knee replacement are generally held to be excellent, these procedures only represent one aspect of potential treatment for what is a chronic regional pain syndrome. In many cases, surgery might be sufficient treatment. On the other hand, in chronic pain conditions such as low back pain, there are many influences (such as psychological status and comorbid pain) that contribute to chronicity other than the underlying regional pathology. Similar non-specific factors may influence the chronic pain and disability associated with hip and knee osteoarthritis, and may act as barriers to full recovery despite the prosthesis. There is evidence that those people who develop osteoarthritis are at higher risk of comorbidity due to conditions other than musculoskeletal problems, even allowing for age.¹⁵ However, it is unlikely that such conditions alone explain the differences found in the French study, given that the analysis identified restrictions that were quite specific to the lower limb and to the knee and hip areas, suggesting that there is residual disability

postoperatively which is specific to the joint disease in such patients. The role of psychological distress in the study was not clear, because there were no direct measures of anxiety and depression. However, previous studies have suggested that mental health status is little different pre- and postoperatively in patients who have undergone arthroplasty and that it is comparable with (and sometimes better than) that of the general population.^{10 11 16-19} It seems that people awaiting an arthroplasty or who have recently undergone this operation have rather better mental health than population controls, and there is evidence that optimism in older patients is linked with less psychological distress.²⁰

"Older patients are optimistic about arthroplasty and have less psychological distress"

A further explanation of the finding that patients who have had an arthroplasty do not recover to levels of general health seen in the general population might be that the very risk factors that contributed to the development of osteoarthritis in the first place still exist as influences on the persistence of pain and disability after prosthesis. Likely candidates include sociodemographic factors, obesity, and quadriceps weakness. Griffin *et al* followed up 56 patients who had undergone primary knee arthroplasty 10 years previously.²¹ Patients who were obese had lower knee function scores than patients who were not obese; most of their problems were "attributable to more difficulty with climbing stairs". Overall, current evidence on the effects of obesity on outcomes of arthroplasty is conflicting.¹⁴ Education has also been shown to be an important predictor of pain severity six months after hip or knee replacement surgery.¹³ If such sociodemographic factors influence a patient's capacity to access postoperative care or their willingness to undertake rehabilitation procedures, for example, then this may continue to put some people at a disadvantage in achieving full postoperative recovery.

How useful are large population studies of the impact of health care?

The broader question which the French paper raises is the usefulness of such big population studies in estimating the overall impact of health care in the general population. It is actually rather difficult to tell from the results how important a contribution hip and knee arthroplasties make to lowering levels of lower limb pain and disability in the total adult population, and the authors themselves make it clear that they do not wish the study to be used in this way. What their paper does highlight is the continuing potential need that there may be for

health care in those who have received a prosthesis, and the potential impact which preventive measures, such as weight reduction and appropriate physical activity, may have in reducing levels of pain and disability generally in the population.

In conclusion, a number of questions remain about the healthcare policy and provision needed. Firstly, what are the expectations of these patients and what expectations should health professionals be communicating? Advice and information may help to generate realistic expectations of life after joint replacement. The findings from Boutron *et al* illustrate, irrespective of expectations, that lower limb function postoperatively will not necessarily be equivalent to that in the general population. This leads to the second question, could we do any better for these patients? This relates to issues such as the quality of prostheses and of surgery, the selection of patients, the timing of their surgery, and the content of their pre- and postoperative care. On the one hand, if patients with worse preoperative pain and physical function have lower levels of improvement after surgery, there may be an argument for undertaking surgery at an earlier stage in the course of the disease. On the other hand, attention to, and treatment for, both specific and non-specific influences on chronic lower limb pain and disability (from physiotherapy to weight reduction, pain management to social support and care) might improve both pre- and postoperative symptoms and function. Future allocation of healthcare resources for hip and knee arthroplasties will need to take account of these issues, particularly in countries where there is evidence of current underprovision of surgery.²² The French data provide a challenge to researchers, clinicians, and policy makers to ensure that hip and knee arthroplasties have maximum public health impact.

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Authors' affiliations

C Jinks, M Lewis, P Croft, Primary Care Sciences Research Centre, Keele University, Keele, Staffordshire ST5 5BG, UK

Correspondence to: Dr C Jinks;
c.jinks@cphc.keele.ac.uk

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