Efficacy of an accelerated recovery protocol for Oxford unicompartmental knee arthroplasty: a randomised controlled trial

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Two techniques for knee arthroplasty in patients with knee osteoarthritis requiring surgery were compared. One was the minimally invasive Oxford unicompartmental knee arthroplasty (UKA), with usual discharge at about 5 days. The other was an accelerated protocol based on a day case anaesthetic and long acting local anaesthetic field block, where the aim was discharge on the same day.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients with medial compartmental knee osteoarthritis who fulfilled the criteria for UKA were candidates for the study. They also had to live near the centre and have the ability to tolerate large doses of anti-inflammatory drugs. Patients were excluded if they had diabetes, severe respiratory disease, previous heart surgery or deep vein thrombosis, or were older than 75 years.

Setting
The setting was tertiary care. The economic study was performed in an orthopaedic centre in Oxford, UK.

Dates to which data relate
Subsequent to this abstract being written, the main author of the paper has informed us that the trial was conducted between January 2002 and September 2003 and that the price year was 2003.

Source of effectiveness data
The effectiveness data were derived from a single study.

Link between effectiveness and cost data
The costing was carried out prospectively on the same sample of patients as that used in the effectiveness analysis.

Study sample
Of 245 potential UKA patients, 41 were finally included. Twenty-one were allocated to the accelerated arm and 20 to standard care. The authors described clearly the reasons for non-participation. Power calculations were reported.
Study design
This was a single-centre, randomised controlled trial with 6 months' follow-up, in which the unit of randomisation was the patient. Blocked randomisation was carried out using sealed opaque envelopes. There were no losses to follow-up. The outcomes were assessed blind at 6 months.

Analysis of effectiveness
It appears that the analysis has been conducted on those patients for whom data were available. There were 2 patients in the accelerated group who did not have complete data. The primary outcome measure was the Oxford Knee Assessment, which comprises the Oxford Knee Score (OKS) and the American Knee Society Clinical Rating System (AKSS). Preoperative and 6-month postoperative scores were evaluated. The groups were reported to be comparable at baseline in terms of their age and baseline OKS and AKSS scores.

Effectiveness results
There were generally no statistically significant differences between the groups in terms of early postoperative pain, movement and pain at 2 and 6 weeks, or the patients' final assessment at 6 months. The exception was range of knee flexion, where the accelerated group had an average of 5 degrees extra knee flexion than the standard care group.

Statistically significant improvements from baseline were observed in both groups for the OKS, AKSS Objective, AKSS Functional, and pain scores.

One major complication was found in each group.

Patient satisfaction was similarly high in both groups.

The average stay was 1.5 days for the accelerated group versus 4.3 days for the standard care group.

Clinical conclusions
In terms of effectiveness and acceptability, this study indicates that accelerated discharge for UKA is feasible and acceptable to patients.

Measure of benefits used in the economic analysis
No summary measure of benefit was used in the economic analysis. In effect, a cost-consequences analysis was performed.

Direct costs
The cost categories included were fixed costs, hospital stay cost, additional outpatient appointments, and the cost of specialist registrar time. The fixed costs comprised surgical staff, anaesthetics, prosthesis and pharmacy. Discounting was appropriately not carried out given the short time horizon of the study. The resource quantities were derived from the trial. The quantities and the costs were partly reported separately. Although the perspective was not specifically stated, it appears to have been that of the health service. The costs were estimated on the basis of actual data. Since this abstract was published, the main author of the paper has informed us that the cost data were derived from Nuffield's finance officer and the price year was 2003.

Statistical analysis of costs
The costs were treated deterministically. No statistical tests were used in the analysis.

Indirect Costs
No indirect costs were included.
Currency
UK pounds sterling (£).

Sensitivity analysis
No sensitivity analysis was reported.

Estimated benefits used in the economic analysis
See the 'Effectiveness Results' section.

Cost results
The total costs were 3,391 in the accelerated group and 4,634 in the standard care group. This led to an average saving of 1,243 per patient for postoperative care in the accelerated group, an approximately 27% saving on the total average cost per patient in the standard care group.

Synthesis of costs and benefits
The costs and benefits were not combined.

Authors’ conclusions
The present study showed that accelerated discharge for unicompartmental knee arthroplasty (UKA) is feasible, acceptable and probably safe to patients, and has potential value to the National Health Service. It can also achieve cost-savings of 27% and significantly reduce hospital bed occupancy.

CRD COMMENTARY - Selection of comparators
The authors clearly described the standard practice and the new comparator under investigation. You should decide whether the comparators chosen are relevant to your setting.

Validity of estimate of measure of effectiveness
The authors stated that the study was a small single-centre randomised study, which is an adequate design to evaluate feasibility and acceptability. There was no report of an analysis by intention to treat, and many eligible participants were not included because of the very strict inclusion criteria, mainly because they lived far from the geographical limits. The groups appear to have been broadly comparable at baseline. Although the study showed no difference between the groups in the main results, the authors reported that it was adequately powered to detect such differences.

Validity of estimate of measure of benefit
No single measure of benefit was reported. See comments in the 'Validity of estimate of measures of effectiveness' field (above).

Validity of estimate of costs
Although a perspective was not specifically stated, it seems to have been that of a health system. As such, relevant categories appear to have been included. The source of the unit costs was not reported in the paper, although it was likely to have been the setting of the trial. The price year was not reported in the paper. This makes it harder to extrapolate the results to other settings or dates.

Other issues
The authors did not report comparative results with findings from other studies. The issue of generalisability was partly addressed by recognising the strict inclusion criteria of the study in terms of geographical proximity, and the difficulties in wider extrapolation. The conclusions reflected the scope of the analysis. The authors acknowledged many of the study limitations.

Implications of the study
The new protocol of accelerated discharge for UKA appears to have been feasible and acceptable in this small trial, and it can achieve substantial cost-savings. Nevertheless, the final conclusions, especially those about safety and complications, need further research and audit.

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