Prolonged conservative care versus early surgery in patients with sciatica from lumbar disc herniation: cost utility analysis alongside a randomised controlled trial


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.

CRD summary
The objective was to examine the cost-effectiveness of early surgery, in comparison with prolonged conservative care, for adult patients, with sciatica caused by lumbar disc herniation. One year results were similar but faster recovery from sciatica meant that early surgery was likely to be a cost-effective alternative to prolonged conservative care, especially when the reduction in absenteeism from work was taken into account. Patient preference might indicate the best strategy. The analysis was well conducted and presented. The authors’ conclusions appear to be valid.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective was to examine the cost-effectiveness of early surgery, in comparison with prolonged conservative care, for adult patients, under 65 years old, with sciatica caused by lumbar disc herniation.

Interventions
Early surgery was compared with six months of prolonged conservative care provided by the general practitioner (GP). Surgery consisted of the removal of the disc herniation through a unilateral transflaval approach, using magnification. Patients receiving conservative care, with increasing symptoms before six months or persistent symptoms after six months, were offered microdiscectomy.

Location/setting
Netherlands/tertiary care.

Methods
Analytical approach:
This economic evaluation was based on a single study with a one-year time horizon. The authors stated that the analysis was carried out from the perspectives of the health care system and society.

Effectiveness data:
The clinical evidence came from a randomised controlled trial (RCT), carried out in nine Dutch hospitals and involving 283 patients, with 142 (mean age: 43 ± 10 years, 68% men) in the conservative care group and 141 (mean age: 42 ± 10 years, 63% men) in the early surgery group. The two groups were similar at baseline in terms of demographic and clinical characteristics. The length of follow-up was one year. The patient quality of life was the primary clinical outcome.

Monetary benefit and utility valuations:
The utility valuations were derived from the sample of patients enrolled in the RCT, using the utilities reported by the patient through three questionnaires, which were the US and UK European Quality of life (EQ-5D), the Short Form (SF)-6D, and the visual analogue scale. The values were estimated at several time points over the patients’ follow-up period.

Measure of benefit:
Quality-adjusted life-years (QALYs) were used as the summary benefit measure.
Cost data:
The economic analysis included the costs of hospital stay, visits to health care professionals (specialists, GP, physical therapy, paramedics, and alternative health care), home care, paid domestic help, informal care, drugs and aids (for example, crutches), out of pocket expenses as a result of the hernia (for example, swimming), and hours of absenteeism from work. The resource use data were derived from diaries kept by the patients. The hospital costs were derived from diagnosis and treatment prices for disc surgery in 75 centres. Other health care costs were based on Dutch standard prices. The costs of absenteeism were valued using the human capital method. The unit costs and quantities of resources used were presented separately for all items. All costs were in Euros (EUR) and the price year was 2008. Missing data were estimated using a multiple imputing approach.

Analysis of uncertainty:
The issue of uncertainty was addressed by calculating a confidence interval (CI) around the differences in total costs and benefits. Acceptability curves were also presented. Furthermore, the use of three methods to derive the utility valuations and two different economic perspectives varied the sources and the types of relevant data.

Results
Over one year, the difference in QALYs favoured the early surgery group and was 0.044 (95% CI: 0.005, 0.083) using the UK EQ-5D; 0.032 (95% CI: 0.005, 0.059) using the US EQ-5D; 0.024 (95% CI: 0.003, 0.046) using the SF-6D; and 0.032 (95% CI: ~0.003, 0.066) using the visual analogue scale.

From the perspective of the health care system, the costs were higher in the early surgery group, and the cost difference was EUR 1,819 (95% CI: 842, 2,790). From the societal perspective, the cost difference was EUR -12 (95% CI: -4,029, 4,006), as the higher costs due to surgery were totally offset by the reduction in productivity losses associated with a faster recovery.

When using the UK EQ-5D, the probability that the incremental cost per QALY gained with early surgery was below the threshold of EUR 40,000 was 76% from the societal perspective. Slightly worse findings were achieved with the other utility measures. From the perspective of the health care system, the incremental cost per QALY gained with early surgery was EUR 41,000 (95% CI: 14,000, 430,000) when using the UK EQ-5D and EUR 57,000 (95% CI: 19,000, 436,000) using the US EQ-5D.

Authors’ conclusions
The authors concluded that a fast recovery from sciatica meant that early surgery was likely to be a cost-effective alternative to prolonged conservative care, mainly due to the reduction in absenteeism from work. Thus, patient preferences might indicate the best strategy.

CRD commentary
Interventions:
The rationale for the selection of the comparators was clear. The two strategies appear to have been appropriately selected given that the conservative approach was often advocated for this patient population, while the advantages of early surgery had not previously been assessed in an RCT.

Effectiveness/benefits:
An RCT is generally considered to be a valid source of clinical evidence given the strengths of its design, which should reduce the potential impact of selection bias and confounding factors. The two patient groups were comparable at baseline with respect to clinical and economic factors. The inclusion and exclusion criteria were reported and the sample size was justified on the grounds of power calculations. The clinical analysis followed the intention-to-treat principle. These features of the study enhance its validity. The derivation of the benefit measure was clear. The authors used three different tools to elicit patient preferences in order to overcome the limitations of using a specific instrument for this patient population. QALYs are a validated and generalisable benefit measure.

Costs:
The analysis was consistent with the two perspectives. A breakdown of cost items was provided. Moreover, the details of unit costs, quantities of resources used, sources of data, price year, and the use of statistical tests were reported. This
enhances the transparency of the cost analysis and the results were clearly presented.

Analysis and results:
The synthesis of costs and benefits was appropriately performed through an incremental analysis, the findings of which were clearly presented and discussed. The issue of uncertainty was implicitly addressed by calculating CIs, which provided the likely ranges of values. However, these ranges were very wide due to the relatively small differences in the benefit measure. The authors stated that caution was required when generalising these findings to other health care settings, given the peculiarities of the Dutch context, which has a trend towards a high rate of surgery, relatively short waiting times, and protective employment conditions. The authors considered the chosen one-year time-horizon appropriate for the economic evaluation, because the clinical evaluation showed no differences beyond the first year and a longer time horizon would have reduced the statistical power. Forty percent of the patients randomised to receive prolonged conservative care underwent disc surgery (cross-over), but the authors did not consider this a limitation, since this is part of clinical reality and should therefore also be part of the economic evaluation. Finally, the inevitable lack of masked allocation of patients to treatment group might have affected the estimation of both the costs and benefits.

Concluding remarks:
On the whole, the analysis was well conducted and presented. The authors’ conclusions appear to be valid.

Funding
Supported by a grant from the Netherlands Organization for Health Research and Development.

Bibliographic details

PubMedID
18502912

DOI
10.1136/bmj.39583.709074.BE

Original Paper URL
http://www.bmj.com/content/336/7657/1351

Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

MeSH
Adolescent; Adult; Aged; Cost-Benefit Analysis; Health Care Costs; Humans; Intervertebral Disc Displacement /complications /economics /surgery; Middle Aged; Netherlands; Quality-Adjusted Life Years; Sciatica /economics
/etiology /surgery

**AccessionNumber**
22008100707

**Date bibliographic record published**
01/12/2008

**Date abstract record published**
20/05/2009