Function after spinal treatment, exercise, and rehabilitation: cost-effectiveness analysis based on a randomized 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.

CRD summary
This study assessed the cost-effectiveness of a rehabilitation programme and an education booklet for the management of patients after discectomy or lateral nerve root decompression surgery. The authors concluded that there was no conclusive evidence to support the booklet or rehabilitation, over usual care, after spinal surgery. The methods were valid and transparent, but the authors highlighted the considerable uncertainty in their conclusions.

Type of economic evaluation
Cost-utility analysis

Study objective
This study assessed the cost-effectiveness of a rehabilitation programme and an education booklet, compared with usual care, for the management of patients after discectomy or lateral nerve root decompression surgery.

Interventions
The interventions were a rehabilitation programme, an education booklet, or both, and these were compared against usual care. The education booklet was given to patients when they were discharged from hospital. The rehabilitation programme consisted of 12 one-hour classes, delivered twice a week by an experienced physiotherapist, beginning six to eight weeks after surgery. The classes followed a protocol of exercises and progression.

Location/setting
UK/out-patient.

Methods
Analytical approach:
This economic evaluation was carried out alongside a clinical trial, with a one-year time horizon. The authors stated that the analysis was conducted from the perspective of the English NHS and Personal Social Services.

Effectiveness data:
The clinical data came from a prospective, multicentre, factorial, randomised controlled trial; the Function After Spinal Treatment, Exercise, and Rehabilitation (FASTER) trial. This was carried out at seven centres in London, between June 2005 and March 2009. A total of 338 patients were recruited and were allocated to four groups; 64 received the booklet, 79 received the rehabilitation programme, 89 received both, and 84 received usual care. The patients who received both interventions were not analysed. The primary endpoint was the Oswestry Disability Index score. Patients were followed-up for one year.

Monetary benefit and utility valuations:
Health-related quality of life was derived from patients in the clinical trial, using the European Quality of life (EQ-5D) instrument. These estimates were converted into utility scores, using an EQ-5D social tariff estimated by a representative sample of the UK population. Multiple imputation was used for missing data at each follow-up point.

Measure of benefit:
Quality-adjusted life-years (QALYs) were the summary benefit measure.
Cost data:
The economic analysis included the costs of the interventions (booklet and staff for the rehabilitation programme); hospitalisations; day cases; out-patient visits; accident and emergency visits; general practitioner (GP) and nurse visits, home visits, and telephone calls; physiotherapy sessions; and prescribed medications. Private contacts for physiotherapy, osteopathy, chiropractic treatment, and over-the-counter medications were considered. The resource quantities were from the clinical trial. The unit costs were from official NHS tariffs and published estimates. All costs were in UK pounds sterling (£) and referred to 2008 to 2009 prices.

Analysis of uncertainty:
Ordinary least-squares regression was used to estimate the statistical significance of differences in the clinical and economic results. Nonparametric bootstrapping was used to generate cost-effectiveness acceptability curves.

Results
At one year, the QALYs were 0.683 with usual care, 0.672 with the booklet, and 0.681 with rehabilitation. The NHS costs were £3,322 with usual care, £3,122 with the booklet, and £3,358 with rehabilitation. The private costs were £146 with usual care, £168 with the booklet, and £108 with rehabilitation.

Usual care was more expensive and more effective than the booklet, and rehabilitation was more expensive and more effective than usual care, but these differences were not statistically significant.

The incremental cost-utility ratios were £3,852 with no booklet, over the booklet, and £82,817 with rehabilitation, over no rehabilitation. These estimates were highly uncertain, but the conclusions were not altered in the sensitivity analyses. At a threshold of £20,000 to £30,000 per QALY, the booklet was cost-effective in 25% to 29% of simulations and rehabilitation was cost-effective in 43% to 47% of simulations.

Authors’ conclusions
The authors concluded that there was no conclusive evidence to support the booklet or rehabilitation, over usual care, for the management of patients after spinal surgery.

CRD commentary
Interventions:
The authors justified their selection of the comparators. The combined intervention of the booklet and the rehabilitation programme was excluded from the analysis, as there were no statistically significant interactions between the two interventions. There were a number of possible rehabilitation programmes and the analysis included one of these.

Effectiveness/benefits:
The clinical evidence was from one study, which was well designed, as it was multicentre and randomised. Few details were reported since the study was published elsewhere, and the authors focused on the economic analysis. The method used to deal with missing data (multiple imputation) was described. The uncertainty in the clinical results was analysed using nonparametric bootstrapping. QALYs were an appropriate benefit measure, and they capture the impact of the disease on the patients’ health and allow cross-disease comparisons. Health-related quality of life was estimated, using a validated instrument, by patients enrolled in the trial. The quality of life results for each measurement were well described.

Costs:
The economic analysis was carried out appropriately for the perspective of the public payer. Private costs borne by patients were considered, but they were small, compared with NHS expenses. The unit costs and resource quantities were presented separately and a breakdown of cost items was given. The prospective detailed collection of patient-level costs should have ensured accurate data. The data sources were not reported in detail, but they reflected the NHS perspective. Reflation exercises will be possible as the price year was reported. The costs were analysed statistically and the economic analysis was satisfactorily performed.

Analysis and results:
The results were clearly presented. An incremental analysis was used to synthesise the costs and benefits of the
interventions. Both deterministic and probabilistic sensitivity analyses were carried out to assess uncertainty and the results were clearly reported. The authors acknowledged that a possible limitation of their analysis was the short time horizon, but this did not affect the conclusions because no differences in QALYs and costs were found at one year. The results appear to be specific to the UK and the rehabilitation programme, and not transferable to other settings.

Concluding remarks:
The methods were valid and transparent, but the authors highlighted the considerable uncertainty in their conclusions.

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