Laparoscopic fundoplication compared with medical management for gastro-oesophageal reflux disease: cost effectiveness study

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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
The aim was to estimate the long-term costs, benefits, and cost-effectiveness of laparoscopic surgery compared with continued medical management for patients with gastro-oesophageal reflux disease. The authors concluded that surgery appeared to be more cost-effective, but there was uncertainty about the duration of the treatment effect and the outcomes after failure of surgery. The study was adequately reported and the methods were sound. The authors’ conclusions are consistent with the evidence presented.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective was to compare the long-term costs, benefits, and cost-effectiveness of laparoscopic surgery versus medication, for patients with gastro-oesophageal reflux disease (GORD).

Interventions
Laparoscopic fundoplication (surgery) was compared with the continued use of proton-pump inhibitors (medical management) for male patients aged 45 years with GORD.

Location/setting
UK/secondary care.

Methods
Analytical approach:
A state-transition Markov model was used to simulate the ongoing probabilities of medical management, surgery, and death, over a lifetime. The evidence was from one published randomised controlled trial (Grant, et al. 2008, see 'Other Publications of Related Interest' below for bibliographic details) and from other sources. A lifetime horizon was adopted and the authors stated that the perspective was that of the health care system; the UK National Health Service (NHS).

Effectiveness data:
For the first year after the start of treatment, the clinical data were from the REFLUX trial (Grant, et al. 2008). The long-term data were calculated by meta-analyses following a literature search. The key clinical parameters were the health-related quality of life in quality-adjusted life-years (QALYs), returns to medical management, returns to surgery, and operative mortality.

Monetary benefit and utility valuations:
The utility estimates were collected using the European Quality of life (EQ-5D) questionnaire in the REFLUX trial and the general population (Kind, et al. 1999, see 'Other Publications of Related Interest' below for bibliographic details) and using expert opinion for some states, such as patients requiring proton-pump inhibitors after surgery.

Measure of benefit:
The benefit measure was the QALY and these were discounted at an annual rate of 3.5%.
Cost data:
The analysis included the direct medical costs to the NHS of tests, surgical procedures, hospital and primary-care visits, and medication. These costs were derived from the REFLUX trial plus several national published sources that included NHS unit costs and the British National Formulary. The price year was 2008 to 2009 and all prices were in UK pounds sterling (£). An annual discount rate of 3.5% was applied.

Analysis of uncertainty:
The authors evaluated the impact of parameter uncertainty, using probabilistic sensitivity analysis.

Results
The discounted lifetime cost per patient was £3,411 for continued medical management compared with £5,026 for laparoscopic surgery; an additional mean cost per patient of £1,616 for surgery. Surgery was associated with a QALY gain of 0.61 compared with medical management.

The incremental cost-effectiveness ratio of surgery compared with medical management was £2,648 per QALY. At a willingness-to-pay of £20,000 per QALY, the probability of surgery being cost-effective was 94%.

These results were sensitive to variations in some key parameters. For example, a change in treatment effect duration from five to two years reduced the probability that surgery was cost-effective at £20,000 per QALY from 88% to 66%.

Authors’ conclusions
The authors concluded that surgery appeared to be more cost-effective than continued medical management for GORD, but there was uncertainty about the duration of the treatment effect and outcomes after failure of surgery.

CRD commentary
Interventions:
The interventions were appropriate comparators and were likely to represent the usual care options in the study setting. They were also likely to be relevant in other settings.

Effectiveness/benefits:
The predominant use of the REFLUX trial was appropriate as this was the only available source of comparative health-related quality of life data for the two interventions. This randomised controlled trial was conducted in the UK, which was the setting for this study. The utility data were collected during the trial and the instrument was reported; the method used to calculate the QALYs was fully described. The use of QALYs was appropriate, given the impact of the disease on quality of life and the impact of surgery on survival.

Costs:
The perspective was clearly defined and all the relevant costs appear to have been included. The unit costs and resource use data were provided, which should enable the cost analysis to be replicated in other settings. The authors provided details of the price year, sources of data, and the use of discounting.

Analysis and results:
The incremental analysis identified the relative cost-effectiveness of the strategies. The issue of uncertainty was appropriately addressed, using probabilistic sensitivity analyses. The results of both the base-case and the sensitivity analyses were adequately reported and the authors highlighted and discussed the strengths and weaknesses of their analysis.

Concluding remarks:
This cost-effectiveness analysis was generally satisfactorily performed and transparently reported. The authors' conclusions appear to be appropriate.

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