A value-based medicine cost-utility analysis of idiopathic epiretinal membrane surgery
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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 investigated the cost-effectiveness of epiretinal membrane surgery compared with no surgery. The authors concluded that the surgery was very cost-effective for improving individual visual acuity and quality of life. Although there were some limitations, the methods were mostly transparent and clearly reported. Overall the quality was reasonable as were the conclusions, but they should be considered in light of the limitations described.

Type of economic evaluation
Cost-utility analysis

Study objective
The aim was to assess the costs and effects of epiretinal membrane surgery compared with no surgery, in both the better and the worse seeing eye.

Interventions
This study compared epiretinal membrane surgery with no surgery in two scenarios, which were the better-seeing eye, and the worse-seeing eye. The population was a hypothetical cohort of patients requiring epiretinal membrane surgery, with a mean age of 65 years.

Location/setting
USA/out-patient care.

Methods
Analytical approach:
A Markov model was used for the worse-seeing eye scenario as this best captured the recurrent risk of epiretinal membrane surgery. For the better-seeing eye scenario, surgery was assumed to be definitive and a decision tree model was used. The analysis covered a 19-year period and the authors stated that the perspective was that of the third-party insurer (US Medicare).

Effectiveness data:
The clinical data for epiretinal membrane surgery effectiveness, measured by visual acuity and complications, were derived primarily from three observational studies. The complications included cataract progression, cataract extraction, retinal tear or detachment, epiretinal membrane recurrence, endophthalmitis, and persistent cystoid macular oedema.

Monetary benefit and utility valuations:
Visual acuity measurements were converted into utility scores using time trade-off utilities, which were directly elicited from a sample of patients with ocular disease (Brown. 1999, see ‘Other Publications of Related Interest’ below for bibliographic details).

Measure of benefit:
The measure of benefit was quality-adjusted life-years (QALYs). Discounting was applied at an annual rate of 3%.

Cost data:
The direct medical costs were included for medical management of the surgery and complications, physician costs, ambulatory procedures, anaesthesia, and drug costs. The unit costs were obtained from publicly available fee and price schedules. Costs were discounted at 3% and reported in 2005 US dollars ($).
Analysis of uncertainty:
Uncertainty was measured using one-way sensitivity analyses on the key parameters which included; visual acuity, health care costs, and epiretinal membrane recurrence rates.

Results
For the better-seeing eye scenario, epiretinal membrane surgery was associated with a mean gain in discounted QALYs of 0.93 over 19 years compared with no surgery. The incremental cost per QALY gained was $4,680. The sensitivity analyses found this result to be robust to changes in the key parameters, with results varying from $3,510 to $6,245.

For the worse-seeing eye scenario, epiretinal membrane surgery was associated with a mean gain in discounted QALYs of 0.27 over 19 years compared with no surgery. The incremental cost per QALY gained was $16,146. The sensitivity analyses found utility values to be the most sensitive parameter, with results varying from $12,110 to $21,520.

Authors’ conclusions
The authors recommended epiretinal membrane surgery as a very cost-effective therapy in both worse- or better-seeing eyes, in comparison with other procedures.

CRD commentary
Interventions:
The authors chose no surgery as the comparator for the established epiretinal membrane surgery. A detailed description of the surgical procedure and the typical patient profile were not provided.

Effectiveness/benefits:
The effectiveness of epiretinal membrane surgery was derived from published research. Details on the identification and selection of the sources for this data were not reported. Neither was any assessment of their internal validity, which makes it difficult to report on the quality of the clinical estimates or determine if the best available evidence was used. The utility values were measured in US patients with ocular disease and readers were referred to the publication by Brown (1999) for details on the methods and quality of this data.

Costs:
The perspective was that of the third-party insurer (US Medicare) and all the relevant direct medical costs appear to have been considered, including those of several important complications. The cost measurement and valuation methods were clearly reported and the unit costs were fully and clearly presented. All appropriate adjustments seem to have been made and reported. Overall, the cost analysis seems to have been well conducted.

Analysis and results:
A full description, including a diagram of the model, was presented. The authors appropriately conducted an incremental analysis and clearly presented the results, along with the sensitivity findings. The authors identified and discussed two limitations of their study; the reliance on utility values from patients with various retinal diseases, and the limited cost perspective, with its impact on the results if a wider range of costs was included. They also acknowledged variations in the patient characteristics and costs in different settings. Parameter variability was evaluated in one-way sensitivity analyses and the results were fully presented. A more thorough probabilistic sensitivity analysis would have strengthened the study.

Concluding remarks:
Despite some limitations with data transparency for the clinical effectiveness, the methods were generally appropriate and well reported. Overall the quality was reasonable as were the conclusions, although they should be considered in light of the limitations described.

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Other publications of related interest

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