Incremental cost effectiveness of laser photocoagulation for subfoveal choroidal neovascularisation


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
Laser photocoagulation for subfoveal choroidal neovascularisation.

Type of intervention
Treatment.

Economic study type
Cost-utility analysis.

Study population
Patients eligible for treatment of subfoveal choroidal neovascularisation as defined by the Macular Photocoagulation Group.

Setting
Hospital. The study was set in the USA.

Dates to which data relate
Effectiveness and resource use data were collected from studies published between 1991 and 2000. Cost data were derived from a 1998 source. The price year was 1999.

Source of effectiveness data
Effectiveness data were derived from a literature review.

Modelling
A Markov decision analytic model was used to determine the cost-utility of modelled laser photocoagulation therapy for subfoveal choroidal neovascularisation.

Outcomes assessed in the review
The review assessed mortality and morbidity, visual results, exudative macular degeneration, and utility values.

Study designs and other criteria for inclusion in the review
Patient data were collected from a randomised controlled trial (conducted by the Macular Photocoagulation Group).
Sources searched to identify primary studies
Not stated.

Criteria used to ensure the validity of primary studies
Not stated.

Methods used to judge relevance and validity, and for extracting data
Summary statistics from individual studies.

Number of primary studies included
At least 8 studies were included.

Methods of combining primary studies
Narrative method.

Investigation of differences between primary studies
Not stated.

Results of the review
Patients undergoing treatment had a normal life expectancy. Laser therapy was assumed to have no effect on life expectancy. Visual acuity in the treatment group was 20/125 at 0 years, and 20/320 at 0.25, 0.5, 1, 2, 3 and 4 years. Visual acuity in the control group was 20/125 at 0 years, 20/200 at 0.25 years, 20/320 at 0.5 years, 20/320 at 1 year, 20/400 at 2 years, 20/400 at 3 years and 20/500 at 4 years. 28% of patients had exudative macular degeneration involving both eyes. 10% of remaining unilateral cases per year converted to bilateral exudative macular degeneration. Utility values ranged from 0.8 when the visual acuity was 20/40 in the best seeing eye to 0.53 when the visual acuity in the best seeing eye was 20/500. These data formed the principal input parameters for the model.

Measure of benefits used in the economic analysis
Quality-adjusted life years (QALYs) were used as the measure of benefits. Benefits were discounted at an annual rate of 3%.

Direct costs
Direct costs were not discounted given that most costs fell within a three-month treatment period. Quantities and costs were reported separately. Direct costs reflected the costs of subfoveal laser therapy, including the expense to the payer of an initial outpatient consultation, destruction of localised lesion of the choroid, and fluorescein angiography with interpretation and report. The quantity/cost boundary adopted was that of the health service. The estimation of quantities and costs was based on actual data. Cost estimates were collected from a 1998 source. The price year was 1999.

Indirect Costs
No indirect costs were included.

Currency
US dollars ($).
Sensitivity analysis
Sensitivity analysis was performed on the discount rate.

Estimated benefits used in the economic analysis
The net gain of QALYs was -0.004 during the first three months, 0.0 from 3 months to 1 year, 0.022 from three months to two years, 0.023 for the third year, 0.028 for the fourth year, and 0.188 after the fourth year. The total number of QALYs gained by laser therapy was 0.257 (0.09 when the discount rate was 10%).

Cost results
The total costs of laser therapy were $1,047. This represents an incremental cost against the 'do nothing' option.

Synthesis of costs and benefits
The incremental cost-effectiveness of laser therapy for subfoveal choroidal neovascularisation was $5,629 per QALY. In the sensitivity analysis this varied from $4,074 with a 0% discount rate to $11,633 with a discount rate of 10%.

Authors' conclusions
The incremental expense of laser therapy for subfoveal choroidal neovascularisation appears to be highly cost-effective. The result compares quite favourably with other interventional therapies across different medical specialities.

CRD COMMENTARY - Selection of comparators
A justification was given for the comparator used namely no therapy. You, as a user of the database, should decide if this health technology is relevant to your setting.

Validity of estimate of measure of benefit
The authors did not state whether a systematic review of the literature had been undertaken. More details could have been provided about the design of the review and the method of combining primary effectiveness estimates. Estimation of benefits was modelled. The instrument used to derive the measure of health benefit was not stated. Utility values were derived from patients and are therefore likely to be valid.

Validity of estimate of costs
Some good features of the analysis included the following: all direct cost categories were included; quantities and costs were reported separately; costs were used to proxy prices; and the price year was reported. However, the cost analysis could have been improved in the following respects: no sensitivity analyses were conducted on costs or quantities; costs of laser retreatment or additional laser therapy after the 3-month post-operative period were not included; costs of travelling for treatment were not considered; medical costs of screening for choroidal neovascularisation and the associated societal costs such as loss of employment and benefits paid for incurred disability were not included.

Other issues
The authors did make appropriate comparisons of their findings with those from other studies. However, the issue of generalisability to other settings was not addressed. The authors do not appear to have presented their results selectively. The authors examined patients eligible for treatment of subfoveal choroidal neovascularisation and this was reflected in the authors’ conclusions.

Implications of the study
Laser therapy for the treatment of subfoveal choroidal neovascularisation appears to have a positive benefit for individual patients and society in general, albeit at moderate additional cost.
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