A cost-utility analysis of microwave endometrial ablation versus thermal balloon endometrial ablation

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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 evaluated the cost-effectiveness of two widely used second-generation endometrial ablation techniques, microwave or thermal balloon endometrial ablation, for women with heavy menstrual bleeding. The authors concluded that microwave ablation was likely to be more cost-effective than thermal balloon ablation, at one year, but long-term follow-up was needed. The methods were good and they and the results were well reported. The authors’ conclusions appear to be appropriate and valid, for the NHS perspective.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective was to evaluate the cost-effectiveness of two widely used second-generation endometrial ablation techniques for women with heavy menstrual bleeding.

Interventions
The two interventions were microwave endometrial ablation and thermal balloon endometrial ablation. Both techniques were performed under either local or general anaesthesia, depending on patient preference.

Location/setting
UK/in-patient secondary care.

Methods
Analytical approach:
The economic evaluation was based on a single randomised controlled trial (RCT). The time horizon was 12 months and the authors stated that the perspective was that of the UK NHS.

Effectiveness data:
The effectiveness evidence was from a RCT (Sambrook, et al. 2009, see 'Other Publications of Related Interest' below for bibliographic details), in which 314 women were randomised by an automated telephone system. They were blinded to the type of intervention they received and they were analysed on an intention-to-treat basis. The follow-up was one year and the main clinical effectiveness estimate was their quality of life.

Monetary benefit and utility valuations:
The quality of life was assessed, using the European Quality of life (EQ-5D) questionnaire, at baseline, two weeks, six months, and one year. The responses to the EQ-5D were converted into utilities using a tariff scale derived from a sample of the UK general public.

Measure of benefit:
The measure of benefit was quality-adjusted life-years (QALYs).

Cost data:
The direct NHS costs were those of: the thermal balloon and microwave endometrial ablation equipment; operation staff, consumables, and drugs; hospitalisation; postoperative complications; general practitioner consultations;
medications; investigations; and out-patient visits. Hospital resource use was from staff-completed forms and other resource use was from patient-completed forms. The unit costs were from the Scottish health service, the manufacturers of the equipment, a compendium of health and social care costs, the British National Formulary, and NHS Reference Costs. As the equipment could be used over many years, its costs were converted into equivalent annual costs at a 3.5% discount rate and assuming it would last 10 years. The patient costs included their time away from usual activities and that of a friend or family to attend health care visits. This information was collected by postal questionnaire. Travel costs were based on public transport or actual mileage. Time was valued using the average wage for employed women, 57% of average wage for housework, and 43% of average wage for leisure. The price year was 2006. All costs were reported in UK pounds sterling (£).

Analysis of uncertainty:
Non-parametric bootstrapping, with 1,000 simulations, was used to estimate the confidence intervals around the difference in the mean total cost, and mean QALYs. The results were presented in a cost-effectiveness acceptability curve. One-way sensitivity analyses were performed using plausible cost ranges and varying the methods used to calculate the costs.

Results
The average NHS cost was £758.46 per patient for the thermal balloon group compared with £576 for the microwave group; a difference of £181 per patient. The average QALYs gained were 0.86 for the thermal balloon group compared with 0.87 for the microwave group; a difference of 0.017 per patient (not significant).

The NHS costs were combined with the QALYs and microwave ablation was dominant over thermal balloon ablation as it was more effective and cheaper. At a £20,000 per QALY threshold, the probability that microwave ablation was cost-effective compared with thermal balloon ablation was 93%, from the NHS perspective.

The average patient plus companion cost was £333.35 for the thermal balloon group compared with £494.27 for the microwave group; a non-significant difference of £160.92.

Authors' conclusions
The authors concluded that, at one year, microwave endometrial ablation was likely to be more cost-effective than thermal balloon endometrial ablation, but long-term follow-up was needed.

CRD commentary
Interventions:
The interventions were clearly reported and appear to have been appropriate comparators, but it was unclear if all the relevant comparators were included. The population was described.

Effectiveness/benefits:
The effectiveness estimates were from one RCT. The authors reported how the patients were randomised, the blinding process, the follow-up, and how the outcomes were measured. This trial appears to have been well conducted, which means that the results were internally valid. The measure of benefit was appropriate and the method used to derive the QALYs was reported.

Costs:
The authors reported both the NHS and the patient costs, but the patient costs were not included in the cost-utility analysis, which was appropriate for the NHS perspective. The methods used to measure the resource use were reported in full as were the sources for the unit costs for the NHS and for the patient. The price year was reported and discounting was not necessary as the time horizon was one year.

Analysis and results:
The costs and outcomes were appropriately combined in an incremental cost-utility ratio. The impact of uncertainty was tested using statistical and sensitivity analyses, which varied the way in which the resource use was valued. Both the methods and the results were appropriately reported. The main limitation of the study, which was acknowledged by the authors, was the relatively short time horizon.
Concluding remarks:
The methods were good and they and the results were well reported. The authors’ conclusions appear to be appropriate and valid.

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Other publications of related interest

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