Treatment for early endometrial cancer: cost-effectiveness analysis

Fanning J

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
Two treatment protocols for the management of early endometrial cancer. In one protocol, the gynaecologist, rather than gynaecologic oncologist, evaluates the patient with preoperative ultrasound or magnetic resonance imaging (MRI) and intraoperative frozen section to determine if operative consultation with a gynaecologic oncologist for lymphadenectomy should be performed. In the other protocol, 10-12% of gynaecologic oncologists perform lymphadenectomy on all patients; administer postoperative brachytherapy for node negative tumours with deep invasion, poor differentiation or microscopic cervical involvement; and reserve postoperative teletherapy for tumours with nodal metastasis.

Type of intervention
Diagnosis and treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population was hypothetical patients with early-stage endometrial cancer.

Setting
Hospital. The economic analysis was carried out in the USA.

Dates to which data relate
Effectiveness and resource use data were obtained from literature published between 1990 and 1998. The price year appears to have been 1997.

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

Outcomes assessed in the review
The following outcomes were assessed: rate of poor differentiation; rate of poor differentiation or deep invasion; rate of microscopic cervical involvement; incidence of lymph node metastasis; accuracy in predicting high-risk tumours; the percentage of cases in which ultrasound/MRI, frozen section, hysterectomy, lymphadenectomy, teletherapy, and brachytherapy are performed in each treatment protocol; survival; and morbidity.

Study designs and other criteria for inclusion in the review
The review included one prospective trial on surgical staging (the only prospective trial in this field), plus other studies
whose designs were not specifically reported.

Sources searched to identify primary studies
Not reported.

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

Methods used to judge relevance and validity, and for extracting data
Not reported.

Number of primary studies included
A total of 9 studies were included in the review.

Methods of combining primary studies
Not reported.

Investigation of differences between primary studies
Not reported.

Results of the review
The outcome results were as follows:
rate of poor differentiation, 14%;
rate of poor differentiation or deep invasion, 34%;
rate of microscopic cervical involvement, 12%;
incidence of lymph node metastasis, 10%;
accuracy in predicting high-risk tumours, 70%.

The percentage of cases in which the following procedures were performed for each treatment protocol is shown below.

Ultrasound/MRI: selective lymphadenectomy/selective teletherapy, 0%; preoperative assessment/selective lymphadenectomy/selective teletherapy, 100%; and lymphadenectomy/ selective brachytherapy, 0%.

Frozen section: selective lymphadenectomy/selective teletherapy, 45%; preoperative assessment/selective lymphadenectomy/selective teletherapy, 100%; and lymphadenectomy/ selective brachytherapy, 0%.

Hysterectomy: selective lymphadenectomy/selective teletherapy, 100%; preoperative assessment/selective lymphadenectomy/selective teletherapy, 100%; and lymphadenectomy/ selective brachytherapy, 100%.

Lymphadenectomy: selective lymphadenectomy/selective teletherapy, 32%; preoperative assessment/selective lymphadenectomy/selective teletherapy, 32%; and lymphadenectomy/ selective brachytherapy, 100%.

Teletherapy: selective lymphadenectomy/selective teletherapy, 46%; preoperative assessment/selective lymphadenectomy/selective teletherapy, 46%; and lymphadenectomy/ selective brachytherapy, 10%.
Brachytherapy: selective lymphadenectomy/selective teletherapy, 0%; preoperative assessment/selective lymphadenectomy/selective teletherapy, 0%; and lymphadenectomy/selective brachytherapy, 36%.

The five-year survival rate was 97% and 98% for lymphadenectomy/selective brachytherapy and 87% for selective lymphadenectomy/selective teletherapy. Morbidity associated with complete lymphadenectomy in endometrial carcinoma was 1% in a trial. Postoperative vaginal brachytherapy was 4% as compared to 38% for teletherapy.

**Measure of benefits used in the economic analysis**
No summary benefit measure was identified, and the economic analysis proceeded on the assumption of equal benefits for the three treatment protocols (because of approximately the same survival and morbidity rates), resulting in a cost-minimisation study.

**Direct costs**
Costs were not discounted due to the short time frame of the cost analysis. Some quantities were reported separately from the costs. Cost items were reported separately. Cost analysis covered the costs of hospital and physician charges for ultrasound/MRI, frozen section, hysterectomy, lymphadenectomy, teletherapy, and brachytherapy. The perspective adopted in the cost analysis was that of the payer. Costing was based on CPT (physician's current procedural terminology) and DRG (disease related group) codes. CPT and DRG payer reimbursements were chosen because they seemed to accurately assess true costs. Payer reimbursement was calculated using the mean value of the three major private insurance carriers in the local area along with Medicare and Medicaid. The price year appears to have been 1997. Cost analysis did not cover the costs of morbidity.

**Indirect Costs**
Not included.

**Currency**
US dollars ($).

**Sensitivity analysis**
One-way sensitivity analyses were performed on survival rate.

**Estimated benefits used in the economic analysis**
Not applicable.

**Cost results**
The average cost per patient treated in the standard selective lymphadenectomy/selective teletherapy protocol was $13,199 compared to $14,040 in the preoperative assessment/selective lymphadenectomy/selective teletherapy protocol. The corresponding value for the lymphadenectomy/selective brachytherapy protocol was $11,678.

**Synthesis of costs and benefits**
Costs and benefits were not combined since the economic analysis was based on cost-minimisation analysis.

**Authors’ conclusions**
Although only 10-12% of gynaecologic oncologists performs lymphadenectomy on all patients, deliver brachytherapy for high-risk tumours and reserve teletherapy for lymph node metastasis, it is a cost-effective treatment strategy for early endometrial cancer.
CRD COMMENTARY - Selection of comparators
The standard selective lymphadenectomy/selective teletherapy was regarded as the comparator. You, as a database user, should consider which health technology is widely used in your own setting.

Validity of estimate of measure of effectiveness
The internal validity of the effectiveness results can not be guaranteed due to the apparent lack of a comprehensive literature review, quality appraisal of the primary studies in the literature, lack of information about the method of combination of primary studies, and investigation of differences between primary studies. However, it was reported that the literature on treatment of early-stage endometrial cancer suffered from the lack of randomised trials (grade I data) and the study did include data from the only prospective study in the literature.

Validity of estimate of measure of benefit
The analysis of benefits was based upon therapeutic equivalence of treatment alternatives. The economic analysis therefore included only costs.

Validity of estimate of costs
Some quantities were reported separately from the costs and adequate details of methods of cost estimation were given. With regard to excluding the morbidity costs, it appears that the cost analysis did not include all relevant cost components, and therefore is susceptible to bias. Using reimbursement data instead of true costs may have adverse effects on the internal and external validity of the cost results. The effects of alternative procedures on indirect costs and patients' out-of-pocket expenses were not addressed.

Other issues
The authors' conclusions may not to be fully justified, as uncertainties in the cost data were not addressed by sensitivity analysis. The issue of generalisability to other settings or countries was not addressed, although some comparisons were made with other studies.

Implications of the study
Because lymphadenectomy/selective brachytherapy results in excellent survival and minimal morbidity and is cost-effective, it is a valid treatment option for early endometrial cancer.

Source of funding
None stated.

Bibliographic details

PubMedID
10483543

Other publications of related interest