A decision analysis of practice patterns used in evaluating and treating abnormal Pap smears

Roland P Y, Naumann R W, Alvarez R D, Kilgore L C, Partridge E E

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
Colposcopic biopsy, cryotherapy, and large-loop excision of the transformation zone (LLETZ) in evaluating and treating patients with abnormal pap smears.

Type of intervention
Diagnosis; treatment.

Economic study type
Cost-effectiveness analysis.

Study population
New female patients to the University of Alabama Colposcopy clinic. The median age of patients was 27 years (range: 14 - 69 years).

Setting
The practice setting was tertiary care. The economic study was carried out at the University of Alabama at Birmingham, USA.

Dates to which data relate
Resource use data were collected in the period 1 July 1992 to 31 December 1993. Price data were from 1994.

Source of effectiveness data
The evidence for outcomes was based on opinion.

Modelling
Decision tree analysis was used to estimate costs.

Methods used to derive estimates of effectiveness
Estimates of effectiveness were based on the authors’ assumptions.

Estimates of effectiveness and key assumptions
The authors assumed that the two treatment modalities, cryotherapy and LLETZ, included in examined strategies, were effective in treating dysplasia. In order to carry out cost-minimisation analysis, the authors (although this was not explicitly stated) must have assumed that these treatments used in an appropriate combination would lead to equal
health outcomes in all four strategies considered.

**Measure of benefits used in the economic analysis**
All procedures considered were assumed to be equal in terms of treatment effects, and hence, the economic study was based on the comparison of costs only.

**Direct costs**
Cost were not discounted. Quantities and costs were not reported separately. All costs were estimated from the perspective of the hospital, including the pathology unit. Cost estimates were derived using a data tree modelling technique, where the proportions of patients requiring certain diagnostics and treatments were based on data from a case series of 614 patients actually examined by traditional colposcopy. Costs were based on a published survey of nationwide (USA) 50th-percentile reimbursement costs for medical procedures and related pathology (see other publications of related interest). The components of each strategy were costed separately.

**Currency**
US dollars ($).

**Sensitivity analysis**
Two-way sensitivity analysis was carried out on the incidence of patients with abnormal Pap smears requiring treatment (treatment rate) and the ability to treat them with cryotherapy (cryotherapy rate). This was carried out to enhance the generalisability of the results.

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

**Cost results**
For the basic treatment algorithms:

- Strategy 1 (traditional colposcopy with treatment of low-grade lesions by cryotherapy and high grade lesions by LLETZ), was most expensive ($1,019 per patient);
- Strategy 2 (colposcopy with observation of patients with mild dysplasia LLETZ of high-grade lesions), was $947 per patient;
- Strategy 4 (the immediate LLETZ of all LGSIL and HGSIL Paps), was $838 per patient;
- Strategy 3 (colposcopy of LGSIL cases before treatment by cryotherapy and immediate LLETZ of HGSIL referral Paps), was least expensive ($787 per patient).

The costs of algorithms, when all saving measures were combined, were: Strategy 1, $785; Strategy 2, $718; Strategy 3, $754; Strategy 4, $838.

**Synthesis of costs and benefits**
Not applicable.

**Authors' conclusions**
This study suggests colposcopy should continue to play an important role in the evaluation of the abnormal Pap smear.
Colposcopy, followed by LLETZ of severe dysplasia, cryotherapy of moderate, and observation of mild dysplasia for regression provides the most cost-effective treatment strategy and has the least potential for excessive treatment compared with other strategies.

**CRD COMMENTARY - Selection of comparators**
A justification was given for comparators used. Strategies involving colposcopic biopsy prior to treatment (1 and 2) were considered as traditional compared to more "aggressive" strategies applying immediate LLETZ as combined diagnostic and therapeutic procedure. You, as a database user, should consider whether these are widely used strategies in your own setting.

**Validity of estimate of measure of benefit**
The effectiveness of the different interventions considered were not examined in this study, so the analysis was principally in terms of cost-minimisation.

**Validity of estimate of costs**
Costing was based on case series, where all the study population actually had colposcopy and a decision model was used to predict what would have happened to these patients, and at what cost, had different evaluation and treatment strategies been adopted. It is not clear if the cost estimates obtained in this way are representative of the costs of procedures when applied in practice.

**Other issues**
The authors did not provide any evidence to validate the assumption of equal health outcomes. Hence, the authors’ conclusions based on average costs per patient may not be justified without reservations. The costing results specific to US health case system may not be generalisable to other countries. The authors also acknowledged that the cost data may be somewhat unique and that this will restrict generalisability. No sensitivity analysis was carried out on cost variables in order to enhance generalisability.

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