Cost effectiveness of pre-operative gonadotrophin releasing analogues for women with uterine fibroids undergoing hysterectomy or myomectomy

Farquhar C, Brown P M, Furness S

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
The use of gonadotrophin-releasing hormone agonists (GnRHa) in women with uterine fibroids, undergoing hysterectomy or myomectomy.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis and cost-benefit analysis.

Study population
The model analysed the increased probability of having a preferred surgical outcome for a hypothetical cohort of women with uterine fibroids who were undergoing hysterectomy or myomectomy, and women volunteers.

Setting
The setting was secondary care. The study was conducted in Auckland, New Zealand.

Dates to which data relate
The authors gave the reference of the systematic review that provided the effectiveness data, and also reported the range of publication dates for the primary studies included in this review (Lethaby et al., see Other Publications of Related Interest). The price year was 2001.

Source of effectiveness data
The evidence was derived from a review of completed studies.

Modelling
A decision tree was designed to compute the expected increased probability of having the preferred surgical outcome because of the intervention (GnRHa treatment).

Outcomes assessed in the review
The primary outcomes were the odds ratios (ORs) recalculated as the increased probability of having the preferred surgical outcome when undergoing hysterectomy or myomectomy. The outcomes were ranked according to clinical preference. A vaginal approach was the most preferable, followed by an abdominal transverse incision, and finally a vertical incision.
Study designs and other criteria for inclusion in the review
The authors briefly stated that the systematic review comprised randomised controlled trials.

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
Twenty-one randomized controlled trials were included in the systematic review.

Methods of combining primary studies
Not reported.

Investigation of differences between primary studies
Not reported.

Results of the review
For women having a hysterectomy, GnRHa treatment increased the probability of having the preferred vaginal approach from 12 to 38% (OR 4.7, 95% confidence interval, CI: 3.0 - 7.4). For those who underwent an abdominal approach, the probability of a preferred transverse incision increased from 67% without the treatment to 84% with the treatment (OR 2.8, 95% CI: 1.8 - 4.3).

Therefore, for patients undergoing hysterectomy:
for the preferred vaginal approach, the final probabilities were 12% without GnRHa treatment versus 38% with treatment; and

for those who underwent an abdominal approach, the probability of a preferred transverse incision was 59% without treatment versus 52% with treatment, and for a vertical incision, 29% versus 10%, respectively.

For patients undergoing myomectomy, the final probabilities of the preferred outcome were 67% without GnRHa treatment versus 100% with treatment (OR 8.95, 95% CI: 1.3 - 60.1).

The chance of recurrence was 28% for women who did not receive GnRHa therapy and 65% for those receiving GnRHa (OR 4.0, 95% CI: 1.1 - 14.7).

Measure of benefits used in the economic analysis
The main benefits considered were the values women placed on avoiding abdominal hysterectomy and on avoiding a vertical incision at either hysterectomy or myomectomy. A willingness-to-pay (WTP) approach was adopted so that the value placed on the preferred surgical outcome could be estimated.
Direct costs
A WTP survey was conducted on 30 women in New Zealand to determine the value placed on having transverse versus vertical incisions, or vaginal versus abdominal approaches for hysterectomy. The cost/quantity boundary adopted was that of the health care system and the patient. The quantities and the costs were reported separately. Broad expenditure items included GnRHa, consultations in the preoperative phase of the treatment, extra consultations for side effects, theatre costs, length of stay in the hospital, and the cost of consultations in the postoperative phase. The costs of recurrence at two years were considered and discounted at a rate of 6%. Resource consumption was determined from the systematic review and from what constitutes standard practice in New Zealand. The unit costs were obtained from rates charged by the National Womens Hospital, Auckland to private patients and from the market for GnRHa. The price year was 2001.

Statistical analysis of costs
Resource use and the costs were treated deterministically.

Indirect Costs
The indirect costs were represented in time off work (hourly wage rate). The price year was 2001. The estimates were derived using the average hourly rate for women in New Zealand.

Currency
New Zealand dollars (NS$).

Sensitivity analysis
Variability in the data was explored. To examine the sensitivity of the results to the assumptions about the cost and effectiveness, two scenarios were developed. The first was a “worse-case” scenario in which the actual costs were assumed to be 50% greater and the effectiveness 50% worse. The second was a more favourable scenario in which the actual costs were assumed to be 50% less and the effectiveness twice as great.

Estimated benefits used in the economic analysis
For a woman having a hysterectomy, the average WTP for undergoing a vaginal approach rather than an abdominal approach was NZ$644 (range: 200 - 2,000), and the WTP for a transverse instead of a vertical approach was NZ$594 (range: 200 - 2,000).

For a woman undergoing myomectomy, the WTP was NZ$792 (range: 200 - 2,000) for a transverse incision and NZ$25 when a hysterectomy may be needed in the future.

Cost results
The expected cost of preoperative treatment was NZ$4,222 (3,032 without treatment) for a patient undergoing hysterectomy and NZ$5,099 (3,564 without treatment) for a patient undergoing myomectomy.

For both treatments, the preoperative cost was a third of the total (NZ$1,544).

The additional cost of treatment with GnRHa was NZ$1,190 for hysterectomy and NZ$1,535 for myomectomy.

Synthesis of costs and benefits
For hysterectomy, the cost of avoiding one abdominal procedure was NZ$4,577 per case and the cost of avoiding one vertical incision was NZ$6,263.

For myomectomy, the cost of avoiding one vertical incision was NZ$4,651.
For a woman having a hysterectomy, the average WTP for having a vaginal approach rather than an abdominal approach was NZ$644. For a woman who may need a hysterectomy in the future, the average WTP for a myomectomy was NZ$25. In both cases the benefits were outweighed by the expected costs.

**Authors' conclusions**
The authors stated that, using clinical and resource use data from a systematic review of 21 randomised controlled trials and estimates of the amount women value the outcomes from a willingness-to-pay (WTP) survey, the benefits of treatment with GnRHa did not justify the expense.

**CRD COMMENTARY - Selection of comparators**
The comparator was not explicitly stated, although the rationale for the choice of the comparator was clear since "no preoperative treatment with GnRHa reflected what had been standard practice in New Zealand.

**Validity of estimate of measure of effectiveness**
The authors used estimates of benefits from a published systematic review. It was unclear from the study whether the methodology and conduct of the review was satisfactory, as only the reference of the review and the number of included randomised controlled trials were reported in this research. The impact of variations in the effectiveness data was explored in the sensitivity analysis.

**Validity of estimate of measure of benefit**
The measure of benefit used was the monetary value placed by women on avoiding abdominal hysterectomy and on avoiding a vertical incision with either hysterectomy or myomectomy. A WTP approach was adopted. Data from this analysis should be treated with some caution for several reasons. First, the sample size was possibly too small (30) to draw any conclusions. Second, there was insufficient consideration of individual differences (such as level of income). Finally, the women could not have had sufficient knowledge of the outcomes since they were volunteers rather than patients.

**Validity of estimate of costs**
The cost analysis was performed from the perspective of the health care system and the patient. As productivity losses were considered, the perspective used in the economic analysis could be considered as "societal". It appears that all the relevant categories of costs have been included in the analysis. The cost estimates are likely to be specific to New Zealand, but the resource quantities were reported separately, thus enhancing the reproducibility of the study in other settings. The price year was reported.

**Other issues**
The authors stated that the outcomes reflected several different settings and countries, implying that generalisability is favourable from a clinical point of view. The authors acknowledged that the cost of treatment might have been overstated if the payers receiving medication were at a lower cost. In addition, few studies considered women with very large fibroids and the WTP data were open to a number of criticisms. The results were not reported selectively and the authors' conclusions reflected the scope of the analysis. However findings of this research should be viewed with some caution, owing to the limitations of the benefit measure.

**Implications of the study**
The study suggested that both the benefits and costs should be considered when gynaecologists are encouraged to use GnRHa, because although evidence for preoperative GnRHa was consistent and statistically significant, neither the size of the benefit, the patients' perspective nor the cost was considered. The results from the study showed that, for the resources to avoid a vertical incision, one or two additional hysterectomies could be undertaken.
Source of funding
None stated.

Bibliographic details

PubMedID
12452466

Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

MeSH
Cost-Benefit Analysis; Female; Gonadotropin-Releasing Hormone /agonists; Humans; Hysterectomy /economics /methods; Leiomyoma /drug therapy /economics /surgery; Myometrium /surgery; New Zealand; Premedication /economics; Preoperative Care /economics /methods; Randomized Controlled Trials as Topic; Recurrence; Risk Factors; Uterine Neoplasms /drug therapy /economics /surgery

AccessionNumber
22002002050

Date bibliographic record published
31/03/2005

Date abstract record published
31/03/2005