Decision-directed hysterectomy: a possible approach to improve medical and economic outcomes

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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.

Health technology
The use of guidelines to assist physicians in selecting the most clinically appropriate route (vaginal or abdominal) for hysterectomy. Specific guidelines were developed on the basis of uterine size, risk factors, and uterine and adnexal mobility and accessibility.

Type of intervention
Treatment (guidelines).

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised women who underwent hysterectomy. The exclusion criteria were a primary diagnosis related to invasive cancer or pregnancy, women with ambiguous ICD-9 procedure codes, patients with unrecorded uterine weight, and patients in whom pelvic pathology was not an indication.

Setting
The setting was a hospital. The economic study was carried out at the St John's Mercy Medical Center in St. Louis (MO), USA.

Dates to which data relate
The effectiveness and resource use data were gathered from 1988 to 1993. The price year was not reported.

Source of effectiveness data
The effectiveness data were derived from a single study.

Link between effectiveness and cost data
The costing was performed retrospectively on the same sample of patients as that used in the effectiveness study.

Study sample
Power calculations, if conducted, were not reported. All consecutive eligible women undergoing hysterectomy over the study period were included in the effectiveness sample. The overall sample consisted of 4,595 cases. These were grouped as type I (patients with pathology confined to the uterus) or type II (women with pathology suspected to extend beyond the confines of the uterus), and according to uterine weight (lower or greater than 280 g). There were 675 women in the DDH group, of which 609 were in the type I sub-group and 66 in the type II sub-group. There were 3,920
women in the non-DDH group, of which 2,568 were in the type I sub-group and 1,352 in the type II sub-group.

**Study design**
This was a cohort study, which was carried out in a single centre. It was unclear whether the study was performed prospectively or retrospectively. The patients were presumably allocated to the study groups depending on the surgeon’s choice. The length of follow-up was not stated. No patient was lost to the follow-up assessment.

**Analysis of effectiveness**
All patients included in the initial study sample were taken into account in the effectiveness study. The health outcomes used in the analysis were the change in the use of vaginal hysterectomy (VH) and the rate of complications observed with four surgical interventions:

- an abdominal hysterectomy (AH);
- a hysterectomy that includes laparoscopy to confirm the diagnosis and the need to complete the surgery via the abdominal route (L-A);
- a hysterectomy that includes laparoscopy to confirm the diagnosis and the need to complete the surgery via the vaginal route (L-V); and
- a VH.

Seven complications were also considered. These were haemorrhage, acute myocardial infarction, postoperative fever or infection, intestinal obstruction, urinary complications, injury to bladder or ureter, and accidental perforation (blood vessel, nerve or organ). The rate of patients experiencing any complication (overall complication rate) was also reported. The study groups were shown to have been comparable under the diagnostic profile.

**Effectiveness results**
When guidelines were used (DDH group), VH was performed in 90% of the women treated and in 100% of the women in the type I group. When the guidelines were not used (non-DDH group), VH was performed in 42% of the women treated and in 64% of the women in the type I group.

Given the high number of complications and surgical procedures considered, only those results that reached statistical significance are reported here.

The complication rate for postoperative fever or infection was 1.8% for L-V and 2.5% for VH in the DDH group, and 0.36% for AH, 5.6% for L-A, 0.4% for L-V and 1.3% for VH in the non-DDH group, (p<0.005).

The complication rate for intestinal obstruction was 25% for L-A in the DDH group, and 0.5% for AH, 1.1% for L-A and 0.1% for VH in the non-DDH group, (p<0.003).

The complication rate for urinary complication was 0.3% for VH in the DDH group, and 0.3% for AH and 1.3% for VH in the non-DDH group, (p<0.003).

The overall complication rate was 50% for L-A, 7% for L-V and 7.9% for VH in the DDH group, and 10.1% for AH, 13.3% for L-A, 5.7% for L-V and 7.3% for VH in the non-DDH group, (p<0.002).

**Clinical conclusions**
The effectiveness study suggested that the use of guidelines reduced the overall complication rate associated with the surgical procedure by about 20%. This result was due to the lower number of AHs performed.
Measure of benefits used in the economic analysis
No summary benefit measure was used in the economic evaluation. A cost-consequences analysis was therefore carried out.

Direct costs
Discounting was not applied, which was appropriate given the short-term analysis performed. The unit costs were not reported separately from the quantities of resources used and a breakdown of the costs was not provided. Hence, it was unclear which cost components were included in the economic evaluation. The cost/resource boundary of the study appears to have been that of the patient (or the insurer). Hospital charges rather than costs were used. Resource use was estimated from the medical charts of the same patients as those included in the effectiveness study. The price year was not reported.

Statistical analysis of costs
An analysis of variance was carried out to test the statistical significance of the differences in length of stay and total costs. The bootstrap technique was then used to resample the database 100,000 times.

Indirect Costs
The indirect costs were not included.

Currency
US dollars ($).

Sensitivity analysis
Sensitivity analyses were not conducted.

Estimated benefits used in the economic analysis
See the 'Effectiveness Results' section.

Cost results
In the DDH group, the charges for patients with a uterine weight lower than 280 g were $4,343 for type I and $4,990 for type II patients. The charges for patients with a uterine weight greater than 280 g were $4,719 (type I) and $5,372 (type II), respectively.

In the non-DDH group, the charges for patients with a uterine weight lower than 280 g were $5,562 for type I and $6,445 for type II patients. For patients with a uterine weight greater than 280 g, the charges were $6,068 (type I) and $6,459 (type II), respectively. The differences reached statistical significance. The length of stay was significantly shorter in DDH patients.

In a hypothetical group of 1,000 patients with uterine weight lower than 280 g, guideline usage would result in $1,184,000 saved and 1,020 patient-bed days saved for type I women, and $185,000 saved and 1,670 patient-bed days saved for type II women.

Synthesis of costs and benefits
Not relevant as a cost-consequences analysis was conducted.

Authors' conclusions
The use of guidelines to select the appropriate route for hysterectomy reduced the complication rate and led to cost-savings, above all among women whose conditions were confined to the uterus.

**CRD COMMENTARY - Selection of comparators**
The author used the practice of no guided choice of the most clinically appropriate route for hysterectomy as the basic comparator, because it represented the standard practice at the study institution before the introduction of the new guidelines. You should decide whether no guided choice represents a valid comparator in your own setting.

**Validity of estimate of measure of effectiveness**
The effectiveness analysis used a cohort study, which was appropriate for the study question. The sample of patients in the study appears to have been representative of the study population, as unselected patients were included in the analysis. Sub-group analyses were also performed. However, the author noted that the impact of confounding factors (such as age differences, pre-existing medical conditions, and concomitant surgeries) on the results of the study could not be ruled out because of the lack of a randomised design. The baseline characteristics of the patients were not reported. Also, it was unclear whether the study was carried out prospectively or retrospectively. The patients were allocated to the study groups according to the physician's preferences. These problems tend to limit the internal validity of the analysis.

**Validity of estimate of measure of benefit**
No summary benefit measure was used in the economic analysis. The analysis was therefore categorised as a cost-consequences analysis.

**Validity of estimate of costs**
The perspective adopted in the study was not explicitly stated, but it appears to have been that of the patient (or the insurance company) because the actual amount the hospital charged was used as a proxy for the costs. However, a cost-to-charge ratio was not used. The overall validity of the cost-analysis was low because few details were provided. The price year was not given and a breakdown of the costs was not reported. This would make it difficult to reproduce the economic study in other settings. The author carried out statistical analyses of the costs and quantities.

**Other issues**
The author compared the results with those reported in two published studies and found comparable results. The issue of the transferability of the study results to other settings was not addressed and sensitivity analyses were not conducted. Consequently, the external validity of the analysis was low. The author noted some limitations of the analysis. For example, implementation of the guidelines was not based on the specific surgeon's training, relying instead on the surgeon's own experience, and interpretation of the clinical pathway.

**Implications of the study**
The study results suggested that the use of AH should be based on clinical characteristics and not on the surgeon's preference.

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**Bibliographic details**