Comparison of laparoscopic-assisted vaginal hysterectomy with traditional hysterectomy for cost-effectiveness to employers

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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
Three types of hysterectomy were examined, laparoscopic-assisted vaginal hysterectomy (LAVH), total vaginal hysterectomy (TVH), and total abdominal hysterectomy (TAH).

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients undergoing a hysterectomy with or without the removal of the ovaries.

Setting
The setting was a hospital. The economic study was carried out in the USA.

Dates to which data relate
The effectiveness and resource use data were gathered from January 2001 to April 2003. The price year was not reported.

Source of effectiveness data
The effectiveness evidence was derived from a single study.

Link between effectiveness and cost data
The costing was carried out on a different sample of patients from that included in the effectiveness study.

Study sample
Power calculations were not reported. All eligible women who underwent a hysterectomy at the study institution (or that were referred to a community hospital with similar size and equipment) from January 2001 to April 2003 were identified and included in the study sample. Overall, 268 women were considered. Of these, 79 underwent TAH, 27 underwent TVH, and 162 underwent LAVH. The patients ranged in age from 24 to 88 years old. The number of women who were employed was 196, but data were obtained only for 54 women. Of these, 39 had a sedentary job (13 in the TAH group, 4 in the TVH group, and 22 in the LAVH group), 13 had a job of moderate activity (1 in the TAH group, 0 in the TVH group, and 12 in the LAVH group), and 2 had a job of strenuous activity (0 in the TAH group, 1 in the TVH group, and 1 in the LAVH group).
Study design
This was a retrospective cohort study. Ninety-six per cent of procedures were performed at the study centre, while 4% of procedures were carried out in a different, but similar size and equipped community hospital. Women were followed until hospital discharge. Some outcome measures were obtained by either an interview with the patient at her postoperative visits or by telephone interview. Some outcome data were available only for a limited number of patients.

Analysis of effectiveness
The analysis of the clinical study was based on all patients included in the study sample. However, the analysis of some outcome measures was restricted to the sample of women for which follow-up data were available. The outcome measures used in the effectiveness study were:

- the length of stay (LOS) for simple hysterectomy, and LOS for additional procedures;
- uterine size;
- operative times;
- surgeons' preferences for types of hysterectomy;
- the frequency of complications;
- the time to return to normal activity, where normal activity was defined as able to perform most or all activities at 90% of preoperative levels;
- the time to return to work; and
- family time off to take care of patients.

The authors did not comment on the baseline comparability of the study groups.

Effectiveness results
The average LOS for simple hysterectomy (average LOS for additional procedures) was 2.98 days (3.5 days) with TAH, 1.5 days (2.12 days) with TVH, and 1.06 days (1.58 days) with LAVH.

Uterine sizes were significantly larger with TAH than with TVH and LAVH. In particular, the average sizes for simple hysterectomy (and additional procedures) were 316 g (154 g) with TAH, 119 g (157 g) with TVH, and 175 g (133 g) with LAVH.

When uterine weights were analysed by type of hysterectomy, there was a significant difference when LAVH was compared with TAH and when TVH was compared with TAH. However, no significant differences between LAVH and TVH were observed.

The operative times were comparable between groups.

The most experienced surgeon preferred LAVH (70% of procedures) to TAH (21%) and TVH (8%). The least experienced surgeon performed more TAH (44%) than TVH (4%), although LAVH remained the preferred approach (51%).

The incidence of complications for simple hysterectomy (and additional procedures) was 27% (30%) with TAH, 5% (12.5%) with TVH, and 8% (16%).

There was no trend for any specific complications, but there were significant differences between the different hysterectomy types. In particular, there was a significant difference in complications between LAVH and TAH, with a
relative risk of complication for LAVH compared with TAH of 0.88 (95% confidence interval, CI: 0.79 - 0.99). However, between TAH and TVH there were no significant differences in complications.

There were no deaths or bowel injuries.

The time to return to normal activity was 5.7 weeks, with TAH, 5.25 weeks with TVH, and 3.17 weeks with LAVH. The time to return to work was 5.93 weeks with TAH, 5 weeks with TVH, and 3.8 weeks with LAVH. The return to normal activities was significantly shorter for LAVH patients in comparison with TAH and TVH. There was no significant difference when TAH was compared with TVH. Family time off was significantly shorter for LAVH patients than for TAH patients. The strenuousness of job did not affect the results of the study.

Clinical conclusions
The effectiveness analysis showed that LAVH had several advantages over TAH and TVH. For example, shorter hospital stay, lower incidence of complications, and faster return to normal activities and work (for both patients and their carers).

Measure of benefits used in the economic analysis
The health outcomes were left disaggregated and no summary benefit measure was used in the economic analysis. In effect, a cost-consequence analysis was carried out.

Direct costs
Discounting was not relevant since the costs were incurred during a short timeframe. The unit costs were not presented separately from the quantities of resources used. All hospital costs were considered in the economic evaluation, but a detailed breakdown of the cost items was not provided. The economic analysis examined hospital charges, actual reimbursements, and adjustments (reduced payments). The cost/resource boundary of the health service payer was adopted. The estimation of costs came from the hospital financial department. Resource use was based on all simple hysterectomies (in addition to the study sample included in the effectiveness study) performed over a 1-year period for hospital charges. However, reimbursements and adjustments were estimated in a sub-set of patients who were cared for in the last 6 months of the study. The price year was not reported.

Statistical analysis of costs
The nonparametric Kruskal-Wallis test was used to test the statistical significance of differences in the costs.

Indirect Costs
The indirect costs were not considered.

Currency
US dollars ($).

Sensitivity analysis
Sensitivity analyses were not carried out.

Estimated benefits used in the economic analysis
See the 'Effectiveness Results' section.
Cost results
Hospital charges were $13,089 with TAH, $10,146 with TVH, and $15,186 with LAVH. Such differences for all types of hysterectomies were significant when compared with each other.

In a sub-set of patients who were cared for in the last 6 months of the study (all women underwent simple hysterectomies without additional procedures), the billed charges were $14,027 with TAH, $6,889 with TVH, and $16,459 with LAVH.

Actual reimbursement to the hospital was $5,064 with TAH, $1,794 with TVH, and $6,873 with LAVH.

The adjustments (reduced payments) were $8,825 with TAH, $5,095 with TVH, and $9,194 with LAVH.

The percentage of adjustment was 63% with TAH, 74% with TVH, and 56% with LAVH. The differences did not reach statistical significance.

Synthesis of costs and benefits
A synthesis of the costs and benefits was not relevant since a cost-consequences analysis was carried out.

Authors' conclusions
When return to normal function and work were considered, laparoscopic-assisted vaginal hysterectomy (LAVH) was the most cost-effective way to accomplish a hysterectomy. Despite higher direct costs, length of stay (LOS) and return to work were shorter with LAVH relative to both total vaginal hysterectomy (TVH), and total abdominal hysterectomy (TAH). This conclusion was further strengthened if lost productivity from care givers were taken into consideration. However, such conclusion was based on the assumed savings to employers arising from the shorter time to return to work. In fact, the indirect costs were not formally included in the cost analysis.

CRD COMMENTARY - Selection of comparators
The authors stated that the LAVH, TAH, and TVH represented three commonly performed surgical procedures for hysterectomy. Therefore, the choice of the comparators was appropriate. You should decide whether they are valid comparators in your own setting.

Validity of estimate of measure of effectiveness
The effectiveness evidence came from a retrospective cohort study. The lack of randomisation and the retrospective nature of this study limit the validity of the estimates. The baseline comparability of the study groups was not reported and no demographics were provided. Therefore, it was unclear whether the study groups were well balanced at study entry. Moreover, the study sample could not be representative of the patient population. The design of the study does not rule out the possible impact of confounding factors and selection or assessment bias. In addition, power calculations were not performed and a very small sample size was available for some outcome measures. These issues tend to limit the internal validity of the analysis.

Validity of estimate of measure of benefit
No summary benefit measure was used in the analysis because a cost-consequences analysis was conducted. Please refer to the comments in the "Validity of estimate of measure of effectiveness" field (above).

Validity of estimate of costs
The perspective adopted in the study was explicitly stated and only hospital costs were considered in the study. The amount of billed charges and the reimbursement given to the hospital were reported. Such estimates were considered as a proxy for the costs. A detailed breakdown of items was not provided, as the costs were presented as a single macro-category. The source of the data was provided. The costing was carried out on a sample of patients different from that
used in the effectiveness study. The price year was not reported, which makes reflation exercises in other settings difficult. The costs were specific to the study setting.

**Other issues**
The authors made some comparisons of their findings with those from other studies. They stated that previous results had shown that LAVH was associated with higher direct costs, but shorter hospital stay and faster return to work could benefit the society as a whole, on account of saved indirect costs. The issue of the generalisability of the study results to other settings was not addressed and sensitivity analyses were not performed. These reduce the external validity of the analysis. The study referred to women undergoing hysterectomy and this was reflected in the authors’ conclusions. The authors discussed the possible explanations for TVH patients not returning to work as soon as LAVH patients. It should also be noted that learning curves are a key issue in the use and safety of laparoscopic procedures.

**Implications of the study**
The study results suggested that LAVH could be considered a cost-effective procedure with respect to how soon the working patient can return to work.

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None stated.

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**Other publications of related interest**


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