Laparoscopic vs open appendectomy: prospective randomized study of 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
Performing laparoscopic appendectomy (LA) or open appendectomy (OA) in patients with acute appendicitis.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients with the presumptive diagnosis of acute appendicitis with a body weight greater than 49.7 kg, and aged 12 years or over.

Setting
Hospital. The economic study was carried out in Denver, USA.

Dates to which data relate
The effectiveness and resource use data were collected between 1 April 1994 and 31 December 1995. The fiscal year was not specified.

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

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

Study sample
Power calculations were not used to determine the sample size. A total of 57 patients were included in the study, of whom 12.3% (7/57) were excluded because of a protocol violation; the remaining consisted of 19 women and 31 men. The LA group consisted of 27 randomly allocated subjects with a median age of 31.5 (range: 12 - 69) years versus 23 in the OA group with a median age of 31.1 (range: 14 - 55) years.

Study design
The study was a prospective randomised controlled trial, carried out in a single centre. The duration of the follow-up was not explicitly specified and loss to follow-up was not reported.
Analysis of effectiveness
The principle used in the analysis of effectiveness was intention to treat. The health outcome measures were operating room (OR) time, length of hospitalisation, postoperative pain measured by a visual analog scale (VAS) score (based on a scale from 0 representing least pain to 10 representing most pain), complications (readmission and postoperative complication), and time necessary before returning to work or school. The groups were comparable in terms of demographic features.

Effectiveness results
The LA group had a median OR time of 81.7 minutes versus 66.8 minutes for the OA group (p=0.002); median length of hospitalisation was 1.1 versus 1.2 days, respectively, (p=0.40); pain measured by VAS mean scores was 3.7 versus 4.0, respectively, (p=0.58). Readmission rate was 18% in the LA group versus 0% in the OA group, although the LA group had 1 case of postoperative complication, (p=0.20). The time necessary before returning to work or school was 14 days in the LA group versus 14 days in the OA group, (p=0.91).

Clinical conclusions
LA offers no real advantages for postoperative pain and time necessary before returning to work or school.

Measure of benefits used in the economic analysis
No summary benefit measure was identified in the economic analysis, and only separate clinical outcomes were reported.

Direct costs
Resource quantities were not reported separately from the costs. The cost items were not fully and consistently reported separately. Hospital charges were used instead of true costs. Total hospital charges, including operative charges and other charges, were retrospectively extracted from the hospital billing records. The perspective adopted in the cost analysis was not stated. The price was not explicitly specified. The surgeon's and anesthesiologist's fees were excluded from the cost analysis. The charges related to readmission were not included in the cost analysis.

Statistical analysis of costs
Student's t test was used to compare the groups in terms of the charges.

Indirect Costs
Not included.

Currency
US dollars.

Sensitivity analysis
No sensitivity analysis was performed.

Estimated benefits used in the economic analysis
Not applicable.

Cost results
The LA group had an average total charge of $5430 versus $3673 for the OA group (p<0.001).

**Synthesis of costs and benefits**
Costs and benefits were not combined since the policy of performing OA was the weakly dominant strategy.

**Authors' conclusions**
Laparoscopic appendectomies and OAs are comparable in terms of complications, postoperative pain control, length of hospitalisation, and recovery time. Patients who underwent an OA had a shorter operative time and lower operating room and hospital charges. Laparoscopic appendectomy does not offer any proven benefits compared with the open approach for the routine patient with acute appendicitis.

**CRD COMMENTARY - Selection of comparators**
A justification was given for the choice of the comparator. It represented the conventional method of treatment in the context in question. You, as a database user, should consider whether this is a widely used health technology in your own setting.

**Validity of estimate of measure of benefit**
The internal validity of the estimates of effectiveness is likely due to the randomised design adopted in the study.

**Validity of estimate of costs**
The resource utilisation was not reported separately from the costs and adequate details of methods of cost estimation were not given. The study suffered from the lack of a prospective and comprehensive cost analysis. Hospital charges were used as a proxy for costs.

**Other issues**
The issue of generalisability to other settings or countries was not addressed, however, appropriate comparisons with other studies were made.

**Source of funding**
None stated.

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