Interstitial laser photoagulation for treatment of benign prostatic hypertrophy: outcomes and cost effectiveness
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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 transurethral resection of the prostate (TURP) and interstitial laser coagulation (ILC) for the treatment of benign prostatic hypertrophy (BPH).

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients with symptomatic BPH and obstruction. The following inclusion criteria were considered:

American Urologic Association Symptom Index (AUA-SI) of 15 or higher;
a prostate size of greater than 30 g on transrectal ultrasonography;
a peak flow rate of less than 12 mL/second; and
a post-voiding residual volume of less than 100 mL.

Patients with evidence of prostate cancer or neuropathic voiding dysfunction were excluded.

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

Dates to which data relate
The patients were identified from October 1997 to January 1998. The effectiveness and resource use data were gathered for a 1-year period. The costs were estimated in 1997 and 1998.

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

Link between effectiveness and cost data
The costing was carried out prospectively on the same sample of patients as that used in the effectiveness study.
Study sample
Power calculations were not reported. A sample of 120 patients was included in the study. The ILC group comprised 60 patients (mean age: 73.3 years) enrolled between October 1997 and January 1998. The TURP group comprised 60 patients (mean age: 68 years) identified between October and November 1997. It was not stated whether some patients refused to participate or were excluded for any reasons from the initial study sample.

Study design
This was a prospective cohort study that was carried out in 4 centres (3 centres for ILC patients and 1 centre for TURP patients). The same group of physicians performed all the interventions. The patients were evaluated 3, 6 and 12 months post-operatively. Fifteen patients in the ILC group were lost to follow-up. The reasons for this were death unrelated to the procedure (n=4), dissatisfaction with the treatment (n=3), and living or travelling abroad (n=8).

Analysis of effectiveness
The analysis of the clinical study was restricted to the patients whose follow-up data were available. The primary outcome measure was the mean duration of stay (DOS). The reasons for differences in DOS were also reported. An increase in DOS was defined as an increase of more than 5 days in length of stay. Other outcomes used in the analysis were readmission rates and a set of objective and subjective urinary parameters associated with the ILC procedure. More specifically, improvements in AUA-SI, peak flow, prostate volume and quality of life. The study groups had comparable age profiles at baseline. Other baseline characteristics of the patients were not reported.

Effectiveness results
The mean DOS was 5.9 days in the TURP group and 2.5 days in the ILC group, (P<0.001).

The causes of DOS (TURP versus ILC) were:
clinical complications (3 cases versus 0 cases),
change of clinical regimen (2 cases versus 0 cases),
patient-related psych/social causes (6 cases versus 2 cases), and
hospital-related problems (0 cases in both groups).

The difference in DOS arose from the 11 cases, overall, in the TURP group and the 2 cases in the ILC group, (P<0.001).

There were no significant differences in readmission rates. All objective and subjective urinary parameters associated with the ILC procedure improved over time:

the AUA-SI changed from 25.7 (+/- 5.7) at baseline to 7.2 +/- 4.7 after 12 months;
peak flow changed from 5.6 (+/- 4.7) mL/second at baseline to 14.8 (+/- 6.1) mL/second after 12 months;
prostate volume changed from 46.6 (+/- 34.7) mL at baseline to 34.1 (+/- 19.5) mL after 12 months; and
quality of life changed from 4.4 (+/- 1.1) at baseline (mostly dissatisfied with voiding) to 1.64 (+/- 0.91) after 12 months (mostly satisfied with voiding).

Clinical conclusions
The effectiveness analysis showed that ILC improved clinical and subjective outcomes and led to a significant reduction in hospital stay.
Measure of benefits used in the economic analysis
The health outcomes were left disaggregated and no summary benefit measure was used in the economic evaluation. In effect, a cost-consequences 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 and the cost items were not broken down. The costs were given as macro-categories. The health services included in the economic evaluation were grouped into categories (laboratory tests, radiology, pharmacology, operation and anaesthesia, specific tests, and other services). Equipment costs were also considered. The cost/resource boundary of the hospital appears to have been adopted. The resource use data were derived from the sample of patients included in the effectiveness study. The costs were estimated for hospital sources during 1997 to 1998.

Statistical analysis of costs
Student’s t-test was used to test the statistical significance of differences in the estimated costs.

Indirect Costs
The indirect costs were not considered in the economic evaluation.

Currency
New Taiwan dollars (NT$). In 1997 to 1998 the conversion rate into US dollars ($) was NT$30.5 = $1.

Sensitivity analysis
Sensitivity analyses were not performed.

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

Cost results
The mean admission charges were NT$45,106 in the TURP group and NT$50,705 in the ILC group, (p>0.05). However, significantly fewer pharmacological treatments were used in the ILC group. Similarly, use of radiological studies, operation and anaesthesia fees were lower for ILC-treated patients. In general, operation and anaesthesia fees accounted for approximately half of the total cost.

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

Authors’ conclusions
Interstitial laser coagulation (ILC) was an effective and efficient alternative to transurethral resection of the prostate (TURP) for the treatment of patients with symptomatic benign prostatic hypertrophy (BPH). The performance of ILC on an outpatient basis would lead to cost-savings in comparison with TURP.

CRD COMMENTARY - Selection of comparators
The selection of the comparators was appropriate. TURP represented the 'gold' standard, while ILC was a new laser approach for the treatment of patients with symptomatic BPH. You should decide whether they are valid comparators.
Validity of estimate of measure of effectiveness
The analysis of effectiveness was based on a cohort study, which was appropriate for the study question. The two study groups were examined in different centres and the outcomes were assessed almost simultaneously. The study groups were compared at baseline in terms of their age profile only. It was not reported whether the study groups were comparable in other characteristics that could have affected the clinical outcomes. Also, the mean age of patients lost to follow-up in the ILC group appears to have been higher than that of the patients who remained in the study. Power calculations were not performed and no evidence of the appropriateness of the sample size was provided. A fairly unselected sample of patients was included in the study, thus the study sample was likely to have been representative of the study population. Patient allocation to the study group was based on the centre to which the patient was referred. The use of a randomised design would have been more robust. The outcomes were estimated only in those patients who completed the follow-up evaluation. These issues in part limit the internal validity of the study.

Validity of estimate of measure of benefit
No summary benefit measure was used in the study because, in effect, a cost-consequences analysis was conducted.

Validity of estimate of costs
The authors did not state which perspective was adopted in the study, thus it was unclear whether all the relevant categories of costs were included in the analysis. Only the costs strictly related to hospital admission were considered. Information on the cost items included in the analysis was limited since a breakdown of the costs was not reported. This limits the possibility of replicating the cost analysis in other contexts. The price year was unclear, but the costs were estimated in the period 1997 and 1998. Statistical analyses of the costs were carried out, but the estimates were specific to the study setting. Sensitivity analyses were not performed.

Other issues
The authors made few comparisons of their findings with those from other studies, which had shown the lowest morbidity profile and consistent therapeutic outcomes associated with ILC in comparison with TURP. The issue of the generalisability of the study results to other settings was not addressed and sensitivity analyses were not performed. This reduces the external validity of the analysis. The study referred to patients with symptomatic BPH and this was reflected in the authors’ conclusions.

Implications of the study
The authors suggested that future studies should include a large sample and prolonged follow-up of patients undergoing ILC.

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None stated.

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Other publications of related interest


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