Cost-effectiveness analysis of parathyroidectomy for asymptomatic primary hyperparathyroidism

Zanocco K, Angelos P, Sturgeon C

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.

CRD summary
This study compared the cost-effectiveness of three treatment strategies for 60-year-old patients with asymptomatic primary hyperparathyroidism (PHPT). The authors concluded that, compared with medical monitoring and cinacalcet therapy, parathyroidectomy is the optimal treatment for patients with mild asymptomatic PHPT. Despite limited reporting around the clinical data, the authors provided a relatively transparent analysis. The authors’ conclusions appear appropriate.

Type of economic evaluation
Cost-utility analysis

Study objective
The study compared the cost-effectiveness of three different treatment strategies for 60-year-old patients with asymptomatic primary hyperparathyroidism (PHPT) who were not eligible for parathyroidectomy (PTX), based on the National Institute of Health (NIH) criteria, but who were eligible for surgery.

Interventions
The three main treatment strategies were the monitoring of asymptomatic patients, pharmacologic treatment using a calcimimetic agent (30mg cinacalcet twice daily) and PTX. The former (monitoring) represents current recommended practice in the authors’ setting.

Location/setting
USA/secondary care.

Methods
Analytical approach:
A decision analytical model (decision tree) was constructed in order to compare the cost-effectiveness of the three strategies. Patients’ life expectancy, estimated at 22 years, was used as the time horizon for the analysis. The authors reported the perspective of the study to have been that of the third-party payer.

Effectiveness data:
The effectiveness data were obtained from a review of the literature. The main clinical parameters were the probability of becoming eligible for PTX based on NIH criteria, the cure rate and the complication rate after PTX.

Monetary benefit and utility valuations:
The utilities were derived from published studies identified through a systematic review of the literature using MEDLINE. Studies using the SF-36 health survey method to derive utilities were included.

Measure of benefit:
The measure of benefit was the quality-adjusted life-years (QALYs). Future health benefits were discounted at an annual rate of 3%.

Cost data:
The costs were expressed in US dollars ($). These comprised monitoring costs (medical tests, appointments), drug costs
and hospitalisation costs (diagnostic procedures and tests, management of surgical complications, and health care professionals). The unit costs were derived using US Medicare Diagnosis Related Groups and Current Procedural Terminology codes. For inpatient hospital costs a cost-to-charge ratio was applied to reflect true costs. The price year was 2005. Adjustments for inflation were reported and future costs were discounted at an annual rate of 3%.

Analysis of uncertainty:
One-way sensitivity analyses were conducted on all model parameters. Two-way sensitivity analyses were also performed on the costs of PTX, calcimimetic therapy and monitoring asymptomatic PHPT; the complication rate of PTX; and the quality adjustment factors for recurrent laryngeal nerve and asymptomatic PHPT.

Results
The QALYs gained were 15.766 for the monitoring strategy, 15.929 for PTX and 15.937 for pharmacologic therapy (cinacalcet).

The incremental cost-effectiveness ratio was $4,778 per QALY gained for PTX compared with monitoring and $20,995,772 for pharmacologic therapy (cinacalcet) compared with PTX.

Sensitivity analyses demonstrated that the results were rather insensitive to the cost of PTX, but were sensitive to the quality-of-life estimates for asymptomatic PHPT patients and patients who have been treated.

Authors' conclusions
The authors concluded that, compared with the monitoring strategy and cinacalcet therapy, PTX is the optimal treatment for patients with mild asymptomatic PHPT.

CRD commentary
Interventions:
The interventions, including the dose used for pharmacological treatment, were described clearly. The study was thorough in the coverage of alternative interventions, including current practice in the study setting.

Effectiveness/benefits:
The effectiveness data were derived from published studies, but no systematic search of the literature was reported. Although the sources of the literature were provided, neither the methods used to identify the primary studies nor the inclusion criteria were reported. It is therefore difficult to ascertain whether the best available evidence was used. Utility values and the methods used to derive them were well reported, and the authors highlighted the fact that, although econometric methods were used to convert SF-36 scores to quality-of-life adjustment factors, the results were robust when estimates based on the time trade-off technique were used.

Costs:
The costs included in the analysis would appear to reflect the authors' stated perspective. The cost estimates were obtained from official sources from the study setting. The unit costs, discounting, adjustment for inflation and the price year were reported clearly. The methodology and the results of the sensitivity analyses were reported in sufficient detail.

Analysis and results:
The model structure was presented graphically along with all relevant details and modelling assumptions. The authors conducted and incremental analysis and presented the results adequately. In addition, the methods used throughout the economic evaluation and the sensitivity analysis were well reported. Sensitivity analyses were conducted on modelling parameters, thereby enhancing the generalisability of the study findings and the robustness of the study results. The authors provided a full discussion of the limitations of their study.

Concluding remarks:
Despite limited reporting around the clinical data, the authors provided a relatively transparent analysis. The authors' conclusions appear appropriate.
Funding
None stated.

Bibliographic details

Indexing Status
Subject indexing assigned by NLM

MeSH
Cost-Benefit Analysis; Costs and Cost Analysis /methods; Decision Support Techniques; Health Care Costs; Humans; Hyperparathyroidism, Primary /drug therapy /economics /surgery; Insurance, Health, Reimbursement /economics; Length of Stay /economics; Middle Aged; Naphthalenes /therapeutic use; Parathyroidectomy /economics; Patient Selection; Quality-Adjusted Life Years; Minimally Invasive Surgical Procedures /economics

AccessionNumber
22007000190

Date bibliographic record published
05/02/2007

Date abstract record published
01/12/2008