The management of aldosterone-producing adrenal adenomas: does adrenalectomy increase costs?


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
The study examined the clinical and economic impact of guideline-based (surgical) strategy (adrenalectomy) compared with universal pharmacologic management for primary hyperaldosteronism caused by an aldosterone-producing adenoma. The authors concluded that a management (surgical) strategy following Endocrine Society guidelines was the preferred option from a cost perspective. The study methodology focused on the economic impact of the treatments studied and the clinical side of the study was not extensively described. Thus, caution is required when interpreting the authors’ conclusions.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The study examined the clinical and economic impact of current guideline-based (surgical) strategy (adrenalectomy) compared with universal pharmacologic management for primary hyperaldosteronism caused by an aldosterone-producing adenoma (APA).

Interventions
The first strategy was to follow the Endocrine Society Clinical Practice Guidelines and perform selective venous sampling on all surgical candidates with primary hyperaldosteronism, perform adrenalectomy on patients with APA and pharmacologically manage patients with bilateral adrenal hyperplasia. Drugs were aldosterone receptor antagonists spironolactone and eplerenone and the angiotensin-converting enzyme inhibitor lisinopril. The second strategy was to make no attempt to distinguish between bilateral hyperplasia and APA, forgo selective venous sampling and pharmacologically treat all patients with primary hyperaldosteronism.

Location/setting
USA/secondary care and hospital.

Methods
Analytical approach:
The analysis was based on a Markov cohort model with a lifetime horizon. The authors stated that the perspective was the third-party payer.

Effectiveness data:
A literature review was undertaken to identify relevant sources of inputs. No information on data sources was given. Surgical data were taken from studies published in the previous 10 years and included a total of 439 patients. The success rate (probability of normotension after surgical or medical therapy) was a key input of the model.

Monetary benefit and utility valuations:
Not considered.

Measure of benefit:
No summary benefit measure was used as a cost-consequences analysis was carried out. Success rates were the main outcomes of the treatments studied.
Cost data:
The economic analysis considered only those costs that differed between the treatment strategies and included physician visits, metabolic panels, electrocardiograms, transthoracic echocardiography, drugs, selective venous sampling and laparoscopic adrenalectomy (including hospital stay). Costs were based on Medicare charges and reimbursement rates. For hospital costs a cost-to-charge ratio was calculated for listed diagnosis-related groups. Drug costs were based on average wholesale prices. Costs were in USA dollars ($). The price year was 2009. A 3% annual discount rate was applied.

Analysis of uncertainty:
A threshold analysis was undertaken on each input to determine how the optimal strategy was affected by changing the value of a single variable across a wide range of possible values. One- and two-way sensitivity analyses were carried out to identify influential inputs.

Results
The probability of successful control of hypertension was 48% with medical management and 48.3% after adrenalectomy.

In a hypothetical 40-year-old woman with a life expectancy of 41 years, the discounted expected costs were $27,821 with the guideline strategy and $34,691 with the medical strategy.

The most influential inputs were cost of adrenalectomy, cost of selective venous sampling, probability of surgical failure, probability of unilateral APA, life expectancy, inflation rate for health care and discount rate. Surgery maintained its economic advantage over medical treatment unless substantial changes in these values were considered. For example, a 2.5-fold increase in the cost of adrenalectomy would have been required for universal pharmacologic treatment to become the least costly strategy. Similarly, the probability of finding a unilateral APA would need to decrease to 10% (50% in the base case) to make medical strategy less costly. Overall, using base case estimates, universal pharmacologic treatment was the cheapest for life expectancies of one year to 25.4 years and surgery was the least expensive for life expectancies greater than 25.4 years.

Authors' conclusions
The authors concluded that the management (surgical) strategy following Endocrine Society guidelines was the preferred option from a cost perspective.

CRD commentary
Interventions:
The rationale for selection of comparators was clear as the two available strategies (surgical versus medical treatment) for management of this specific patient population were considered.

Effectiveness/benefits:
Little information was provided on sources of clinical parameters. It was stated that a literature review was conducted to identify key published evidence, but no details of the studies selected were given. It was unclear whether the studies used to obtain success rates for surgical and medical strategies were comparable. It was difficult to make an objective assessment of the validity of these sources and more details would be needed to determine whether study selection was appropriate. There was no summary benefit measure because a cost-consequences analysis was conducted.

Costs:
The economic analysis was carried out appropriately and presented in detail. Cost categories were reported explicitly and unit costs were given for most items. Sources of costs reflected the USA health care system in which reimbursement rates were consistent with the viewpoint of the third-party payer. A cost-to-charge ratio was calculated for hospital costs. Medicare reimbursements might not fully represent true costs but are commonly applied in USA analyses. The price year was stated explicitly which enabled reflation exercises in other time periods. The impact of variations in economic inputs was investigated extensively in the sensitivity analyses. Overall, the economic side of the study was satisfactorily analysed.

Analysis and results:
The economic results of the study were presented clearly; less clear information was provided on the clinical endpoints. No cost-effectiveness ratios were calculated as the authors carried out a cost-consequences analysis. The issue of uncertainty was investigated extensively in the deterministic sensitivity analyses, which considered various alternative estimates for model inputs and threshold values. The authors did not discuss the potential limitations of the study, which were mostly related to the clinical side. The issue of transferability of results was not addressed and these findings should be considered specific to the USA setting.

Concluding remarks:
The study methodology focused on the economic impact of the treatments studied. The clinical side of the study was not extensively described. Thus, caution is required when interpreting the authors’ conclusions.

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