Pharmacoeconomic analysis of paricalcitol and calcitriol in the treatment of secondary hyperparathyroidism in haemodialysis: impact of hospitalisations and survival

Schumock G T, Arruda J A, Marx S E, Melnick J, Sterz R, Williams L A

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 evaluated the cost-effectiveness of paricalcitol injection in comparison with calcitriol injection when used to reduce parathyroid hormone levels in patients undergoing haemodialysis. The authors concluded that paricalcitol injection was both cost-effective and cost-saving compared with calcitriol injection. The methodology of the study appears appropriate and, on the whole, was clearly reported. The authors’ conclusions reflect the scope of the analysis.

Type of economic evaluation
Cost-effectiveness analysis, cost-utility analysis

Study objective
The study evaluated the cost-effectiveness of paricalcitol injection compared with calcitriol injection when used to reduce parathyroid hormone levels in patients undergoing haemodialysis.

Interventions
Paricalcitol injection was compared with calcitriol injection.

Location/setting
USA/secondary care.

Methods
Analytical approach:
A decision tree model was used to assess the annual drug and hospitalisation costs and consequences of treating patients with one of the two interventions being evaluated. The time horizon of the study was 1 year. The authors stated that the perspective was that of the US government.

Effectiveness data:
The evidence came from published studies. Studies were identified through a search of MEDLINE, conducted between January 1960 and June 2006. As the search revealed no randomised controlled trials, data from two observational studies were used. The main clinical parameter was survival.

Monetary benefit and utility valuations:
Utilities were derived from published studies.

Measure of benefit:
The measures of benefit were the numbers of life-years gained and quality-adjusted life-years (QALYs) gained.

Cost data:
The direct costs included drugs and hospitalisation. The drug costs were derived from Medicare reimbursement rates. Hospitalisation rates were derived from the two observational studies used in the effectiveness study. The costs of hospitalisations were calculated in two ways: using the mean diagnostic-related group Medicare reimbursement rates for each hospitalisation; and using the cost per hospital stay, based on Medicare reimbursement rates. The price year was 2005. All costs were in US dollars ($).

Analysis of uncertainty:
Threshold analyses were performed on hospitalisation costs, hospitalisation rates, costs of paricalcitol, and dose to determine at which point paricalcitol was cost equivalent compared with calcitriol. In addition, one-way sensitivity analyses were performed by varying the utility values.

**Results**

The life-years gained were 0.84 with paricalcitol compared with 0.80 for calcitriol. The QALYs gained were 0.378 with paricalcitol compared with 0.348 for calcitriol.

Paricalcitol was associated with a net saving of $5,407 per patient when compared with calcitriol. This meant that paricalcitol dominated calcitriol (i.e. it was more effective and less costly overall).

The results of the threshold analysis and sensitivity analyses showed the results to be robust.

**Authors’ conclusions**

The authors concluded that paricalcitol injection was both cost-effective and cost-saving in comparison with calcitriol injection.

**CRD commentary**

**Interventions:**

Both interventions were well described. A justification for using calcitriol as the comparator was given: it had been used over the past two decades to control elevated parathyroid hormone.

**Effectiveness/benefits:**

The effectiveness data were derived from published studies. The authors only searched one source (MEDLINE), so it is not certain that the best available evidence was identified. The absence of adverse events and the vague health state of hospitalisation introduces some uncertainty into the estimate of measure of benefit. It is unclear whether a 1-year time horizon was appropriate to fully capture the differences in health outcomes between the interventions.

**Costs:**

The perspective was clearly reported. However, not all of the relevant costs were included in the analysis. The authors did not include, for example, visits to the specialist or primary care physician in their analysis. The resource use data were derived from the same studies as those used for the effectiveness review. Consequently, as the effectiveness evidence was based on the results of a literature search of only one database, it is uncertain if the best available data were used. The source of the unit costs was appropriately reported.

**Analysis and results:**

Overall, the analytical approach was well reported, with the model structure being described in detail and a graphical representation given. The results were presented in full. The authors conducted a series of one-way sensitivity and threshold analyses by varying the parameters used in the model. However, probabilistic sensitivity analysis is a more thorough way to fully capture parameter uncertainty. Overall, the level of reporting was good. In addition, the authors acknowledged and highlighted the main limitations of their analysis.

**Concluding remarks:**

The methodology of the study appears appropriate and, on the whole, was clearly reported. The authors’ conclusions reflect the scope of the analysis.

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**Bibliographic details**

Other publications of related interest


Indexing Status
Subject indexing assigned by CRD

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