Cost-effectiveness analysis of aprepitant in the prevention of chemotherapy-induced nausea and vomiting in Belgium

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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.

CRD summary
The objective was to assess the economic benefits of aprepitant for the prevention of chemotherapy-induced nausea and vomiting. The authors concluded that the aprepitant-based regimen could generate cost savings. Overall, it is unclear if the model was too simple to capture all the relevant outcomes and costs. The reporting was transparent in some areas, but lacked detail in others. These limitations should be considered when interpreting the authors' conclusions.

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

Study objective
The objective was to assess the economic benefits of aprepitant for the prevention of chemotherapy-induced nausea and vomiting (CINV) in patients receiving either cisplatin-based or moderately emetogenic chemotherapy regimens.

Interventions
The two strategies compared were an aprepitant strategy and a standard strategy for the prevention of CINV.

Location/setting
Belgium/secondary care.

Methods
Analytical approach:
A decision tree model was used to evaluate the clinical outcomes and costs of the two alternatives. The authors reported that the perspective was that of the Belgian health care system.

Effectiveness data:
The effectiveness data were derived from two published randomised controlled trials (RCTs). The main data were the efficacy of aprepitant in preventing CINV. For both the cisplatin-based and moderately emetogenic chemotherapy regimens, the data were derived from two RCTs (one for each regimen).

Monetary benefit and utility valuations:
The utility values were derived from three published studies.

Measure of benefit:
The measures of benefit were complete response, defined as no emesis and no use of rescue therapy, and quality-adjusted life-years (QALYs) gained.

Cost data:
The direct costs were those of CINV prevention drugs, rescue medication (intravenous, oral and rectal), office physician visits, hospital outpatient visits, and hospitalisations. Two different cost analyses were performed. In the first, the resource use was derived from the two RCTs that supplied the effectiveness data. In the second analysis, the resource use data were derived from data from 43 Belgian hospitals, including medical management and the costs for hospitalised patients. The unit costs were derived from Belgian official sources, including the Belgian public payer.
institution. The price year was 2005 and the costs were in Euros (EUR).

Analysis of uncertainty:
A series of one-way sensitivity analyses were performed on the key parameters, including the treatment cost of emesis, which was decreased by 30%; the clinical benefit of aprepitant, using lower estimates of the confidence intervals; and the unit cost of ondansetron, one of the standard therapy drugs, which was decreased by 30%.

Results
For patients receiving moderately emetic chemotherapy, the complete response rate was 0.40 for standard treatment compared with 0.53 for aprepitant. The QALYs gained were 0.119 for standard treatment compared with 0.133 for aprepitant patients.

For patients receiving cisplatin-based chemotherapy, the average cost per patient, when using RCT-based resource use data, was EUR 671 for standard treatment compared with EUR 605 for aprepitant. When using resource use data from Belgian sources, the average cost was EUR 629 for standard treatment compared with EUR 554 for aprepitant.

For patients receiving moderately emetic chemotherapy, the average cost per patient, when using RCT-based resource use data, was EUR 366 for standard treatment compared with EUR 348 for aprepitant. When using resource use data from Belgian sources, the average cost was EUR 414 for standard treatment compared with EUR 392 for aprepitant.

The costs and benefits were combined using an incremental cost-effectiveness ratio (the additional cost per additional complete response) and an incremental cost-utility ratio (the additional cost per QALY gained). When compared with standard treatment, the aprepitant regimen was dominant (more effective and less costly), irrespective of the outcome measure, the source of resource use data, or the patient population.

The results of the sensitivity analysis showed that these findings were robust to changes in the treatment cost of emesis and the clinical benefit of aprepitant. However, decreasing the cost of ondansetron generated additional costs when aprepitant was compared with standard treatment, which generated incremental cost-utility ratios of between EUR 1,450 and EUR 1,821.

Authors' conclusions
The authors concluded that for cisplatin-based chemotherapy regimens and moderately emetogenic chemotherapy regimens, the aprepitant-based regimen could generate cost savings for the Belgium health care system.

CRD commentary
Interventions:
The two interventions were not clearly defined. It was not clear whether or not the interventions matched those in the RCTs from which the data were derived. Further, no explicit description of the standard treatment regimen was given.

Effectiveness/benefits:
It would appear that the clinical data were derived from well conducted RCTs. However, it was not clear whether a systematic review of the literature was performed, as no details of the methods used to identify and select the RCTs were reported. As a result, it is not possible to ascertain if the best available evidence was used. However, the reporting of the RCTs used was transparent and detailed, which allows some assessment of their internal validity and quality.

Costs:
The perspective was adequately reported. All the costs relevant to this perspective were included. Two cost analyses were reported with alternate sources for the resource use data. Adequate details, such as how the resource use was identified and its sources, were presented for these two analyses. The sources of unit costs were also adequately reported. However, the authors did not explicitly report the time horizon. Judging by the follow-up in the two RCTs the time horizon appears to have been short, which means that discounting, which was not performed, would not have been relevant.

Analysis and results:
The authors used a very simple decision model to evaluate the costs and outcomes of the regimens to prevent CINV. It is unclear whether the simple model covered all the major outcomes associated with CINV prevention and treatment. The uncertainty in the model was evaluated using a series of one-way sensitivity analyses, and although these evaluate the independent impact of the chosen variables, they do not capture the overall uncertainty in the model. Probabilistic sensitivity analyses would have been a better means of capturing the overall model uncertainty. Generally, the cost analysis was reported clearly and in detail, but no mention was made of performing a review to identify the effectiveness data. In addition, the authors reported no limitations to their study.

Concluding remarks:
Overall, it is unclear if the model was too simple to capture all the relevant outcomes and costs associated with the interventions. The methods used to obtain the effectiveness data were not reported in detail, although those used in the cost analysis were reported clearly and fully. These limitations should be considered when interpreting the authors’ conclusions.

Funding
Not stated.

Bibliographic details

PubMedID
17965891

DOI
10.1007/s00520-007-0349-1

Original Paper URL
http://www.springerlink.com/content/y642p4512591531w/fulltext.pdf

Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

MeSH
Antiemetics /economics /therapeutic use; Antineoplastic Agents /adverse effects /economics; Belgium; Cisplatin /adverse effects /economics; Cost-Benefit Analysis; Decision Support Techniques; Decision Trees; Drug Costs; Humans; Morpholines /economics /therapeutic use; Nausea /chemically induced /drug therapy /economics; Vomiting /chemically induced /drug therapy /economics

AccessionNumber
22008101620

Date bibliographic record published
23/12/2008

Date abstract record published