Evaluation of cost-utility of varenicline compared with existing smoking cessation therapies in South Korea
Bae JY, Kim CH, Lee EK

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 cost-effectiveness of varenicline compared with other available smoking cessation drugs. The authors concluded that varenicline could be considered to be cost-effective in South Korea. Given the limited information on the methods used to obtain the clinical effectiveness and cost estimates, it is not clear if the authors’ conclusions were appropriate.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective was to assess the cost-effectiveness of varenicline compared with other available smoking cessation drugs.

Interventions
The following interventions were compared: varenicline; nicotine replacement therapy (NRT); bupropion; and no drugs or the willpower of the patient alone.

Location/setting
South Korea/primary care.

Methods
Analytical approach:
The authors used the Benefits of Smoking Cessation on Outcomes model, a published Markov model, to analyse the impact of the four smoking cessation interventions. The time horizon was until the patients died or reached the age of 100 years. The perspective was not explicitly reported.

Effectiveness data:
The clinical and effectiveness estimates, used to populate the model, were from published studies. The main measures of effectiveness were the efficacy of each smoking cessation intervention and the quit rates associated with each intervention. Two head-to-head trials for varenicline versus bupropion were identified. The quit rates for this comparison were calculated by a meta-analysis of the related trials.

Monetary benefit and utility valuations:
The utilities were obtained from published studies.

Measure of benefit:
Quality-adjusted life-years (QALYs) were the measure of benefit and, as they could be generated over the lifetime of the patient, future QALYs were discounted at an annual rate of 5%, as recommended in Korean guidelines.

Cost data:
The direct costs included were those relating to the treatments, which were the drugs, pharmacy dispensing, physician visits, and travel. Also included were the costs of treating smoking comorbidities, such as chronic obstructive pulmonary disease (COPD), ischaemic heart disease (IHD), lung cancer, stomach cancer, and liver cancer. The costs
of the treatments were from published studies and the costs of treating comorbidities were from the National Health Insurance reimbursement fee schedules. All costs were updated to 2007 values using the Consumer Price Index. As they could be incurred over the lifetime of the patient, future costs were discounted at an annual rate of 5%, as recommended in Korean guidelines.

Analysis of uncertainty:
A series of one-way sensitivity analyses was conducted and a probabilistic sensitivity analysis was undertaken by fitting functional distributions for all the model parameters. The results of the probabilistic analysis were presented in a cost-effectiveness acceptability curve.

Results
For the Korean population, the number of QALYs gained, in thousands, were 18,389 for willpower, 18,502 for NRT, 18,513 for bupropion, and 18,640 for varenicline. The total costs, in thousands, were $5,576,728 for willpower, $5,798,689 for NRT, $6,351,395 for bupropion, and $6,460,784 for varenicline.

Bupropion was extendedly dominated by a combination of NRT and varenicline, which means that giving a proportion of the population NRT and the rest varenicline was less costly and more effective. When NRT was compared with willpower, the additional cost per QALY gained was $1,956. When varenicline was compared with NRT, the additional cost per QALY gained was $4,809.

The results of the probabilistic sensitivity analysis showed that at a cost-effectiveness threshold of $5,000 per QALY gained, the probability that NRT was cost-effective, compared with willpower, was 80.9%, and the probability that varenicline was cost-effective at a threshold of $10,000 per QALY, compared with NRT, was 75.2%.

Authors' conclusions
The authors concluded that varenicline could be considered to be cost-effective in South Korea.

CRD commentary
Interventions:
The type of intervention was stated, but the details of the interventions, such as the duration of treatment, were not. There might be other relevant treatment alternatives for other settings that could have been included in the analysis.

Effectiveness/benefits:
The authors did not report the methods used to identify the relevant studies that supplied the clinical and effectiveness estimates. This makes it impossible to determine if all the relevant information was included. Very little information was provided about the evidence used. For example, the authors did not describe the source used for evidence on the treatment effectiveness of NRT. They did not state if they found any bupropion versus NRT studies. Little information was provided about the utility estimates.

Costs:
The perspective was not explicitly reported, but travel and medical costs were included in the analysis so it appears that a combined third-party payer and patient perspective was adopted. For this perspective, it appears that all the major relevant costs were included. The sources from which this cost information was derived were adequately reported. The authors did not describe how the resource use estimates related to the interventions used in the trials that provided the clinical evidence. Many of the sources were only reported in the footnotes of the supplementary tables online. The price year, time horizon, and discount rate were all reported.

Analysis and results:
The cost and outcome information were synthesised using a decision analytic Markov model. Brief details of this model were reported, without a diagram. The impact of uncertainty on the model’s results was adequately investigated in a probabilistic sensitivity analysis and a series of one-way sensitivity analyses. The main article was very short and succinct, but additional tables for the model parameters, results, and sensitivity analyses were provided online and were free to access. The authors reported, as their main limitations, that much of the effectiveness data was derived from trials conducted in other countries and that productivity losses due to early mortality were not included.
Concluding remarks:
Given the limited information on the methods used to obtain the clinical effectiveness and cost estimates, it is not clear if the authors’ conclusions were appropriate.

Funding
Sponsored by Pfizer Ltd.

Bibliographic details
Bae JY, Kim CH, Lee EK. Evaluation of cost-utility of varenicline compared with existing smoking cessation therapies in South Korea. Value in Health 2009; 12(Supplement 3): S70-S73

PubMedID
20586986

DOI
10.1111/j.1524-4733.2009.00631.x

Original Paper URL

Indexing Status
Subject indexing assigned by NLM

MeSH
Benzazepines /economics /therapeutic use; Bupropion /economics /therapeutic use; Cost-Benefit Analysis; Humans; Male; Markov Chains; Nicotine /economics /therapeutic use; Quality-Adjusted Life Years; Quinoxalines /economics /therapeutic use; Republic of Korea; Sex Factors; Smoking Cessation /economics /methods; Varenicline

AccessionNumber
22010000153

Date bibliographic record published
14/07/2010

Date abstract record published
15/12/2010