Cross-market cost-effectiveness analysis of erlotinib as first-line maintenance treatment for patients with stable non-small cell lung cancer

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 aim was to estimate the cost-effectiveness of erlotinib, compared with best supportive care, as first-line maintenance therapy for patients with stable non-small cell lung cancer, in three European countries. The authors concluded that erlotinib was cost-effective, compared with best supportive care. The methods appear to have been appropriate, but they and the results were not reported in detail, so the authors’ conclusions should be considered with caution.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to estimate the cost-effectiveness of erlotinib, compared with best supportive care, as first-line maintenance therapy for patients with stable non-small cell lung cancer, in three European countries.

Interventions
Erlotinib was given orally at a dose of 150mg per day in addition to best supportive care, and was compared with best supportive care alone.

Location/setting
France, Germany, and Italy/secondary care.

Methods
Analytical approach:
The authors developed a state-transition model, with monthly cycles, using data from a clinical study. The time horizon was five years, which was the expected lifetime of the patient. The authors stated that the perspective was that of the national health care payer in each of the three countries.

Effectiveness data:
The key clinical effectiveness data were from the Sequential Tarceva in Unresectable Non-small cell lung cancer (SATURN) study. This was a randomised multicentre phase III trial of 487 patients, who were randomised to receive either erlotinib or placebo as first-line maintenance therapy (Cappuzzo, et al. 2010, see ‘Other Publications of Related Interest’ below for bibliographic details). The key effectiveness estimates were progression-free survival and overall survival.

Monetary benefit and utility valuations:
Not relevant.

Measure of benefit:
The primary measure of benefit was life-years gained. Future benefits were discounted at rate of 3.5% per year.

Cost data:
The direct costs included the cost of erlotinib and its administration, and the cost of treating adverse events. The cost of erlotinib was based on its list price for each country, assuming the same dose as was delivered in the SATURN trial.
The cost of erlotinib administration was based on pharmacy reference costs. The costs of adverse events were based on the published upper and lower country-specific cost estimates and the frequency of events was based on trial data. The costs were reported in Euros (EUR). Future costs were discounted at a rate of 3.5% per annum.

Analysis of uncertainty:
The authors conducted probabilistic sensitivity analysis and reported the results in cost-effectiveness acceptability curves.

Results
The mean life-years per patient were 1.39 with erlotinib and best supportive care, and 1.11 with best supportive care alone; a gain of 0.28 life-years. The mean cost of best supportive care in all three settings was EUR 23 per patient. The cost of erlotinib and best supportive care was EUR 7,831 in Italy, EUR 11,163 in France, and EUR 13,164 in Germany.

The incremental cost per life-year gained was EUR 27,885 in Italy, EUR 39,783 in France, and EUR 46,931 in Germany.

At a willingness-to-pay of EUR 50,000 in France and Germany and EUR 40,000 in Italy, erlotinib was cost-effective in about 50% of simulations.

Authors' conclusions
The authors concluded that erlotinib was cost-effective, compared with best supportive care, as first-line maintenance therapy for patients with locally advanced or metastatic non-small cell lung cancer.

CRD commentary
Interventions:
The main treatment was described, including its schedule and dose, but best supportive care for both control and the intervention was not explicitly defined. It was not clear if there were other relevant treatments available or whether erlotinib changed the best supportive care given. The comparators might be appropriate for other settings.

Effectiveness/benefits:
The effectiveness data were from a clinical trial with a strong design, but the methods and inclusion and exclusion criteria were not fully described, limiting the assessment of their validity for the three countries. It was not clear if the authors searched the literature for relevant sources of data and whether the best available clinical inputs were used. The measure of benefit was survival, but quality of life is important in the intensive treatment of patients with limited survival.

Costs:
The cost of best supportive care was assumed to be the same for both groups of patients, making the comparison between erlotinib and placebo. This might reflect the practice in other settings, but it was unclear whether all the relevant costs were included for the stated national health care payer perspective. Treatment costs for patients who survived with disease progression were not included; the authors discussed this. The sources for the costs appear to have been relevant to the settings and the discounting was appropriate. The price year was not provided, making relflation exercises difficult. The monthly treatment costs were from a manuscript that was in press and has since been published (Nuijten, et al. 2011, see ‘Other Publications of Related Interest’ below for bibliographic details) and this could be consulted for more information.

Analysis and results:
The incremental approach was appropriate for comparing the two options and the authors used appropriate methods to assess the impact of uncertainty on the results. The reporting of the results was poor, making it difficult to assess their generalisability. The authors discussed some of the key limitations to their study, such as the fact that second-line treatment costs were not accounted for within the model.

Concluding remarks:
The methods appear to have been appropriate, but they and the results were not reported in detail, so the authors’ conclusions should be considered with caution.
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