Cost-utility analysis of indacaterol in Germany: a once-daily maintenance bronchodilator for patients with COPD


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
This study examined the cost-effectiveness of indacaterol, compared with tiotropium or salmeterol, for patients with moderate-to-severe chronic obstructive pulmonary disease, and an average age of 64 years. The authors concluded that indacaterol was cost-effective compared with tiotropium or salmeterol. The identification and selection of the clinical data was not clear, but the methods were good and other details were well reported. The authors’ conclusions appear to be valid.

Type of economic evaluation
Cost-utility analysis

Study objective
This study examined the cost-effectiveness of indacaterol, compared with tiotropium or salmeterol, for patients with moderate-to-severe chronic obstructive pulmonary disease (COPD), and an average age of 64 years.

Interventions
The three treatment options were 150 micrograms of indacaterol once daily, 18 micrograms of tiotropium once daily, and 50 micrograms of salmeterol twice daily. A dose of 300 micrograms of indacaterol once daily was also compared with 18 micrograms of tiotropium once daily.

Location/setting
Germany/primary care.

Methods
Analytical approach:
A Markov model was used to simulate the chronic progressive nature of COPD. The time horizon was three years and the hypothetical cohort consisted of 1,000 patients with a mean age of 64 years and a mean COPD duration of 6.5 years. The authors stated that the analysis was conducted from the perspective of the German health service.

Effectiveness data:
The clinical data were mainly from two long-term multicentre randomised controlled trials (RCTs; Donohue, et al. 2010, and Kornmann, et al. 2010, see ‘Other Publications of Related Interest’ below for bibliographic details). The key clinical parameters were the probabilities of patients moving from one health state to another. These health states included mild, moderate, severe, and very severe disease. The epidemiology for COPD came from the literature or authors’ assumptions.

Monetary benefit and utility valuations:
The utility values were derived using the European Quality of life (EQ-5D) questionnaire and were from the two indacaterol RCTs.

Measure of benefit:
Quality-adjusted life-years (QALYs) were the summary benefit measure. They were discounted at an annual rate of 3%. A secondary measure was the death rate at three years.
Cost data:
The costs included drugs, laboratory tests, general practitioner (GP) visits, emergency department visits, hospitalisations, physiotherapy, and ambulance transport. The costs and quantities of resources were reported separately. The drug costs came from the German drug index, and other costs were from official German sources or the literature. The resource use was from published studies that were considered to be more clinically relevant than the two trials. The costs were in Euros (EUR) and were discounted at an annual rate of 3%.

Analysis of uncertainty:
The overall uncertainty was investigated through probabilistic sensitivity analysis. The impact of particular model inputs was assessed in one-way sensitivity analyses.

Results
Comparing once daily indacaterol 150 micrograms against tiotropium, indacaterol was associated with more QALYs (2.13 compared with 2.12 for tiotropium) at lower costs (EUR 2,067 compared with EUR 2,415 for tiotropium).

Comparing indacaterol 150 micrograms against salmeterol, indacaterol was associated with better QALYs (2.13 compared with 2.12 for salmeterol) at lower costs (EUR 2,043 compared with EUR 2,179 for salmeterol).

The rates of deaths at three years were 10% for indacaterol and 10.4% for tiotropium or salmeterol. The incremental cost-effectiveness ratio for indacaterol 300 micrograms against tiotropium was EUR 28,301 per QALY gained.

The cost-effectiveness acceptability curve of the results of the probabilistic sensitivity analysis, showed that indacaterol 150 micrograms was cost-effective, with a likelihood of 90% against tiotropium or 78% against salmeterol.

Authors' conclusions
The authors concluded that indacaterol was cost-effective compared with tiotropium or salmeterol.

CRD commentary
Interventions:
The selection of the comparators was appropriate. The three drugs were the available treatments.

Effectiveness/benefits:
No information on the methods and conduct of a literature review to identify the sources of clinical evidence were provided. The key evidence was from two large RCTs, which were fully described. This evidence should be reliable, but other relevant evidence might have been omitted. The utilities were measured in an appropriate population and using an appropriate tool (EQ-5D). QALYs were an appropriate summary measure of benefit and they allow comparisons across health care interventions.

Costs:
The categories of costs and their sources were consistent with the perspective stated. The unit costs were reported for all items. The sources for the costs and resource use were reported and reflected the German setting. The authors assumed some cost items, but justifications were given. Discounting was explicitly reported, but the price year was not and this may hinder future reflation exercises.

Analysis and results:
The model was well described and appropriate. An incremental analysis was used to synthesise the costs and benefits of the strategies and the results were clearly presented. The uncertainty was investigated, using a probabilistic approach and the impact of variations in model inputs was investigated in one-way sensitivity analyses. The authors noted and discussed the limitations of their study. Overall, the reporting was good and the methods were robust.

Concluding remarks:
The identification and selection of the clinical data was not clear, but the methods were good and other details were well reported. The authors' conclusions appear to be valid.
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