Cost effectiveness of posaconazole in the prophylaxis of invasive fungal infections in acute leukaemia patients for the French healthcare system


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 posaconazole, compared with the standard azole agents fluconazole or itraconazole, to prevent invasive fungal infections in patients with acute leukaemia in France. The authors concluded that posaconazole was the best option, in patients with neutropenia from chemotherapy for leukaemia. The study methods and reporting were adequate and the authors’ conclusions appear to have been appropriate, given the effectiveness of the drugs in preventing infections.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to assess the cost-effectiveness of posaconazole, compared with the standard azole agents, itraconazole or fluconazole, in the prevention of invasive fungal infections in patients with acute leukaemia in France.

Interventions
Posaconazole (40mg per mL) was compared with itraconazole (100mg or 250mg) or fluconazole (2mg per mL or 200mg).

Location/setting
France/in-patient secondary care.

Methods
Analytical approach:
A Markov model was used to assess the costs and outcomes of the two options. The time horizon was the lifetime of the patient. The authors reported that the perspective was that of the French health care system.

Effectiveness data:
The clinical and effectiveness data were from published studies. The main effectiveness estimate was the proportion of patients with proven or probable fungal infection. This estimate was from a randomised controlled trial, in which 304 patients received posaconazole and 298 received itraconazole or fluconazole; patients were followed-up for at most 12 weeks. The results from this trial were extrapolated using information from the Surveillance Epidemiology and End Results (SEER) database.

Monetary benefit and utility valuations:
None.

Measure of benefit:
The measure of benefit was life-years gained. Future benefits were discounted at an annual rate of 3%.

Cost data:
The direct costs were: antifungal drugs; the additional costs of treating invasive fungal infections in patients with acute myeloid leukaemia; and the additional hospitalisations for infection management. The resource use was from a retrospective review of the charts of 50 patients with proven or probable invasive fungal infections. The hospitalisation...
unit costs were from French tariffs, and the costs of antifungal drugs were from official tariffs. The price year was 2009 and future costs were discounted at an annual rate of 3%. All costs were reported in Euros (EUR).

Analysis of uncertainty:
One-way sensitivity analyses were performed. A probabilistic sensitivity analysis was undertaken by fitting probability distributions to each parameter value.

Results
The average life-years gained were 0.74 with posaconazole and 0.72 with itraconazole or fluconazole. The average costs were EUR 5,223 with posaconazole and EUR 6,083 with itraconazole or fluconazole.

Posaconazole was dominant over itraconazole or fluconazole, as it was less costly and more effective.

In the probabilistic sensitivity analysis, posaconazole was dominant in 75.6% of simulations.

Authors' conclusions
The authors concluded that posaconazole was the best option for the prevention of invasive fungal infections, in patients with neutropenia from chemotherapy for leukaemia, in France.

CRD commentary
Interventions:
The authors only provided brief details of the interventions. The usual practice in the study setting appear to have been included.

Effectiveness/benefits:
The clinical and effectiveness data were from published studies. The main effectiveness estimate was from a randomised controlled trial published in a high-impact peer-reviewed journal, but the methods were not reported. The authors stated that the outcomes were extrapolated from the end of the trial to the lifetime horizon. There was no indication that any survival analysis was conducted and it seems that the relative risk was assumed to be constant over a lifetime, with the baseline risk changing according to data from the SEER database. There was no indication that a review of the literature was performed to find other relevant clinical evidence.

Costs:
The perspective was explicitly reported as that of the French health care system and all the relevant cost categories were included. The resource use was from a retrospective review of patient charts and some items, such as the number and type of examinations, were not recorded and therefore not included. The authors reported how the resource use was derived and the unit costs used to value these resources. The price year, time horizon, discount rate and currency were all reported.

Analysis and results:
A Markov model was used to synthesise the cost and outcome information. The details of the model structure were provided, with a diagram. The impact of uncertainty on the model's results was tested in one-way and probabilistic sensitivity analyses, but it was unclear why the standard deviation for some parameters, such as the relative risk of infection on posaconazole, was assumed to be zero. As the main limitation to their study the authors reported that the design of the cost analysis was retrospective and some information was not recorded.

Concluding remarks:
The study methods and reporting were adequate. The authors’ conclusions appear to have been appropriate, given the effectiveness of the drugs in preventing infections.

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