Economic analysis of micafungin versus liposomal amphotericin B for treatment of candidaemia and invasive candidiasis in Germany
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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
This study examined the cost-effectiveness of micafungin for the treatment of adult patients with candidaemia and invasive candidiasis. The authors concluded that treatment with micafungin was cost-effective compared with liposomal amphotericin B, but there was high uncertainty. Overall, the study was well conducted and presented, and the authors’ conclusions appear to be valid.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
This study examined the cost-effectiveness of micafungin for the treatment of adult patients with candidaemia and invasive candidiasis.

Interventions
Micafungin was compared against liposomal amphotericin B (LAMB). Micafungin was administered at a daily dose of 100mg and LAMB at a dose of 3mg per kg per day.

Location/setting
Germany/hospital.

Methods
Analytical approach:
This economic evaluation was based on a decision tree model that captured the patient pathway through treatment and follow-up. The time horizon was 14 to 20 weeks. The authors stated that the perspective of the hospital was adopted.

Effectiveness data:
The effectiveness of the treatment was obtained from a phase III, double-blind, randomised controlled trial (RCT). The key clinical endpoint was the rate of treatment success and the number of patients alive after the 12-week follow-up period from the end of therapy. The clinical analysis was performed on an intention-to-treat basis.

Monetary benefit and utility valuations:
Not relevant.

Measure of benefit:
The summary benefit measure was the rate of patients treated successfully and alive at the end of the study.

Cost data:
The economic analysis considered the costs of the antifungal treatment and the hospital costs associated with the disease and treatment-related adverse events, including laboratory tests, medical and imaging procedures, and co-medication. The resource utilization was derived from the RCT. In the base case, for patients that dropped out before the end of the study, their resource use up to that point was included. The unit costs were derived from official national sources. All costs were in Euros (EUR) and the price year was 2006.

Analysis of uncertainty:
A probabilistic simulation and a cohort simulation were conducted to consider the general issue of uncertainty. One-way sensitivity analysis was conducted by varying the key model inputs such as the costs of antifungal medications. The model outcomes were also tested in three analyses with different drop-out scenarios for patients treated successfully. An intention-to-treat approach was adopted. The results were presented on the cost-effectiveness plane, as cost-effectiveness acceptability curves, and in a table.

**Results**

The cost per patient was EUR 43,243 with micafungin and EUR 49,216 with LAMB. The rate of treatment success was 52.9% with micafungin and 49.1% with LAMB.

LAMB was a dominated treatment as it was less effective and had higher costs.

The probabilistic sensitivity analysis indicated a large variation in costs due to the uncertainty in the model inputs. The deterministic sensitivity analysis showed that, in general, micafungin remained dominant over LAMB.

**Authors’ conclusions**

The authors concluded that treatment with micafungin in patients with candidaemia and invasive candidiasis was cost-effective, compared with LAMB, but there was considerable uncertainty and comparisons should also be made with other treatment options.

**CRD commentary**

Interventions:
The selection of LAMB as the comparator was appropriate as it was the most commonly used antifungal in the authors’ settings.

Effectiveness/benefits:
It was unclear if a systematic search for studies was conducted to collect the clinical data, which means it is difficult to assess if the best available clinical evidence was used. The clinical data appear to have been collected from a selection of known, relevant studies. The treatment effectiveness came from a RCT, the design of which should have ensured the validity of the clinical evidence. The benefit measure was disease specific and would be impossible to compare with the benefits of other health care interventions. You should consider if the selected measure of benefit adequately captured the major differences in health outcomes between the interventions.

Costs:
The cost categories were consistent with the study perspective. A breakdown of the cost items and associated unit costs was provided. Data sources for the costs and resource use data were well reported. The price year was reported and the authors stated that costs were inflated to 2006, but they did not state the index used. It was not clear if the adverse event probabilities, reported in Table 1, were used in the model or whether other probabilities were used, which were not reported, but were derived from a subgroup consistent with the other effectiveness estimates. In general, the economic analysis was carried out in a transparent fashion.

Analysis and results:
The costs and benefits were appropriately combined using an incremental approach. The issue of uncertainty was extensively investigated using various methodological approaches, which considered various aspects of uncertainty. The reader should consider if a cost-effectiveness threshold of EUR 30,000 per successfully treated and alive patient at the end of the study was appropriate. This unit of benefit was not equivalent to a quality-adjusted life-year. The authors acknowledged some limitations of their model.

Concluding remarks:
Overall, the study was reasonably well conducted and presented, and the authors’ conclusions appear to be valid.

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