Multinational pharmacoeconomic analysis of topical and oral therapies for onychomycosis

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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.

Health technology
Topical lacquer agents and oral agents for the treatment of mild to moderate onychomycosis.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients requiring treatment for onychomycosis.

Setting
Community and hospital. The economic analysis was conducted in Toronto, Canada.

Dates to which data relate
Effectiveness data were taken from literature published between 1960 and 1997. Resource use data were based on expert opinion during the study for which no dates are given. 1996 prices were used.

Source of effectiveness data
Effectiveness data were taken from a meta-analysis of previously completed studies

Modelling
A decision analysis model was used to extrapolate information on final outcomes and costs from data on effectiveness and resource use associated with the different interventions over a five year period.

Outcomes assessed in the review
A meta-analysis was conducted to determine rates for cure, fail and relapse for the different interventions.

Study designs and other criteria for inclusion in the review
All published papers on the treatment of onychomycosis using the selected interventions. Initially only randomised double blind comparative trials were to be included, but the lack of comparative studies led to other types of study also being included. Papers were excluded if data extraction was not possible, patient populations were not suitable, inappropriate organisms (non dermatophytes) or regimens were considered, if efficacy was not considered and if they were review articles. In addition duplicate studies were also excluded.
Sources searched to identify primary studies
Not stated.

Criteria used to ensure the validity of primary studies
Not stated.

Methods used to judge relevance and validity, and for extracting data
The criteria used to judge relevance and validity were not stated. Extracted data were presented in a table summarising the overall rates for each intervention.

Number of primary studies included
33 studies were included in the analysis which included randomised double blind comparative trials and also trials in which comparators were not used. 3 papers reported on AM, 11 on CX, 20 on GR, 13 on IT and 11 on TER.

Methods of combining primary studies
Data were pooled in a meta-analysis using an adaptation of the method of DerSimonian and Laird (1986), modified for single groups.

Investigation of differences between primary studies
Not stated.

Results of the review
The mean cure, improved, failed and relapsed treatment rates for the five interventions were as follows:

AM, 0.358 (+/- 0.019), 0.289, 0.353 and 0.139;
CX, 0.313 (+/- 0.024), 0.265, 0.422, and 0.136;
GR, 0.273 (+/- 0.111), 0.396, 0.331 and 0.318;
IT, 0.730 (+/- 0.085), 0.150, 0.120 and 0.098;
TER, 0.776 (+/- 0.046), 0.123, 0.101 and 0.088.

Measure of benefits used in the economic analysis
The measure of benefits was symptom-free days.

Direct costs
The direct costs of the drug regimens and management were estimated, specifically these included acquisition costs, pharmacy professional fees, physician visits, laboratory tests and nail avulsion surgery. Standard regimens and costs were estimated by consultation with a panel of practising dermatologists in each of the six countries in the study. The cost of CX in the UK and Spain had to be extrapolated from German data as the drug was not available in these countries. Costs of management including costs of switching to secondary therapies following failure were also estimated. The cost of adverse events was not included in the analysis as previous studies have shown these not to represent a significant proportion of the total cost of therapy. 1996 prices were used and costs and benefits were discounted at a rate of 5% per annum beyond the first year of treatment.
Statistical analysis of costs
Not conducted.

Currency
US dollars ($). The Canadian costs were converted at a rate of Can$0.7283 to US$1.

Sensitivity analysis
Each of the costs and probability for rates were varied. Discount rates were varied between 0 and 10% in the sensitivity analysis. The method used was not stated in the paper.

Estimated benefits used in the economic analysis
The number of symptom free days associated with each therapy was not explicitly stated in the economic analysis.

Cost results
The exact costs for all six countries were not presented, although the costs of initial drug therapy in Canada were presented as an example. Total costs for the drug regimen in US$ for Canada were TER $309.59, IT $289.13, GR $448.50, CX $77.16 and AM $115.82. The expected costs of management for the six countries, including the costs of secondary therapy were presented in a graph format. In all countries other than the UK, CX and AM were the least expensive initial management strategies although costs varied greatly between the different countries with an expected cost of just over US$200 in France to more than US$600 in the UK.

Synthesis of costs and benefits
The costs per symptom-free day for each of the treatment regimens were estimated. These were presented only in graphic form. In all countries except the UK, CX and AM had the lowest costs per symptom-free day, ranging from under US$0.20 per day in Italy and France to over US$0.40 in the UK, where TER had the lowest cost per symptom-free day, being just under US$0.40. In all countries GR had the highest costs per symptom-free day. After performing sensitivity analysis, the model was considered to be robust, as only variations outside the 95% cure rates had an impact on the ranking order of treatments.

Authors' conclusions
The authors concluded that the topical therapies CX and AM should be considered as an initial monotherapy in suitable patients for the treatment of mild to moderate onychomycosis as they are effective, inexpensive in most countries compared to alternatives and produce few adverse effects. In patients with more severe symptoms a combination of these topical treatments and oral therapies may be more effective. The authors noted that patients may prefer topical lacquer treatments to oral therapies and that further analysis should include a measure of patient quality of life from the different treatments.

CRD COMMENTARY - Selection of comparators
A justification was given for the comparators used. The oral therapies used in the analysis represent well established therapies for the treatment of mild to moderate onychomycosis.

Validity of estimate of measure of benefit
Benefits were estimated based on a meta-analysis of published studies examining the efficacy of treatments for onychomycosis. Insufficient information was provided by the authors on the methods used in assessing the relevance and validity of studies selected in the meta-analysis nor were the literature sources searched reported. As the authors noted, future studies should also consider quality of life issues.
**Validity of estimate of costs**
Inadequate information was provided on the way in which costs and resources used were estimated and also on the way in which costs have been presented. A table of costs in addition to graphs for all six countries would have been useful. Costs also have been based on the expert opinions of panels of dermatologists rather than as a result of empirical analysis and thus may be subject to bias. In addition CX was not available in Spain and the UK and an estimate of costs had to be made based on information from Germany. Only direct medical costs were determined in the analysis and costs to others in society such as patients could have been included in the analysis.

**Other issues**
It is difficult to generalise the results of this study to other countries or settings due to the reliance on expert panels and the selective way in which the results have been presented. Nevertheless, the conclusions reached by the authors were confirmed by the sensitivity analyses.

**Implications of the study**
There is a need for well designed prospective economic evaluations to be conducted to confirm the findings in this study and also to consider other population groups such as those with severe onychomycosis.

**Source of funding**
None stated.

**Bibliographic details**

**Other publications of related interest**