A comparison of the clinical effectiveness and cost-effectiveness of treatments for moderate to severe psoriasis

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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 various treatments for moderate-to-severe psoriasis. The authors concluded that their cost-effectiveness estimates ranged from a low of $2,611 US dollars ($) per clinical improvement with methotrexate 7.5mg weekly to a high of $35,096 with alefacept 15mg weekly. The study was based on a valid review of the literature and a transparent economic analysis, but no incremental analysis was conducted and the robustness of the authors’ conclusions was not assessed in a sensitivity analysis.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to assess the cost-effectiveness of various treatments for moderate-to-severe psoriasis.

Interventions
The following 15 treatments were considered: acitretin (25mg or 50mg daily); adalimumab (40mg every other week); alefacept (two 12-week courses of 15mg per week); cyclosporine (1.25mg/kg or 3mg/kg daily); efalizumab (1mg/kg weekly); etanercept (25mg or 50mg twice weekly for 12 weeks then once weekly); infliximab (5mg/kg at weeks zero, two, and six, then every eight weeks); methotrexate (7.5mg or 15mg weekly); broadband ultraviolet B (UVB, 2.5 times weekly for eight weeks then twice weekly); psoralen plus ultraviolet A (UVA, 2.5 times weekly for eight weeks then once weekly); and acitretin (15mg daily) plus psoralen and UVA (three times weekly for eight weeks then once weekly).

Location/setting
USA/secondary care.

Methods
Analytical approach:
The analysis was based on a decision model, with a time horizon of one year. The authors stated that the perspective of a managed health care system was adopted.

Effectiveness data:
A systematic review of the MEDLINE database was carried out to identify randomised controlled trials (RCTs) of psoriasis treatments, published in English from 1966 to June 2008. A manual search of references was performed. The relevance and validity of the trials were assessed by the authors and a panel of experts and the inclusion and exclusion criteria were reported. Averages, weighted by the number of patients, were calculated where more than one study was found for a drug. The key endpoint was the treatment effect measured by improvements in the Psoriasis Area and Severity Index (PASI).

Monetary benefit and utility valuations:
Not considered.

Measure of benefit:
The summary benefit measure was the mean percentage change in PASI from baseline to the end point. Two
percentages were considered: a 1% and a 75% improvement, which was considered to be clinically meaningful.

Cost data:
The economic analysis included the following costs: drug acquisition and administration (where relevant), clinical procedures (phototherapy), screening, and monitoring. The resource use was based on product label guidance, published trial data, and authors' assumptions. The costs were average wholesale prices for drugs and Medicare reimbursement rates for other items. They were in US dollars ($) and the price year was 2008.

Analysis of uncertainty:
Not considered.

Results
The percentage change in PASI from baseline to end point was 96.3% with acitretin 25, 57.0% with acitretin 50, 33.4% with cyclosporine 1.25, 52% with cyclosporine 3.0, 58.4% with methotrexate 7.5, 50.9% with methotrexate 15, 76.3% with adalimumab, 45.0% with alefacept, 46.8% with efalizumab, 55.0% with etanercept 25, 66.3% with etanercept 50, 82.8% with infliximab, 64.7% with UVB, 69.6% with psoralen and UVA, and 97.3% with psoralen, UVA, and acitretin.

The total annual costs were $8,272 with acitretin 25, $16,034 with acitretin 50, $3,423 with cyclosporine 1.25, $4,180 with cyclosporine 3.0, $2,033 with methotrexate 7.5, $6,589 with methotrexate 15, $18,705 with adalimumab, $21,058 with alefacept, $20,762 with efalizumab, $11,080 with etanercept 25, $22,159 with etanercept 50, $22,616 with infliximab, $6,334 with UVB, $6,508 with psoralen and UVA, and $12,157 with psoralen, UVA, and acitretin.

The average costs to achieve a 1% improvement in PASI were $86 with acitretin 25, $281 with acitretin 50, $102 with cyclosporine 1.25, $80 with cyclosporine 3.0, $35 with methotrexate 7.5, $129 with methotrexate 15, $245 with adalimumab, $468 with alefacept, $444 with efalizumab, $201 with etanercept 25, $334 with etanercept 50, $245 with infliximab, $98 with UVB, $94 with psoralen and UVA, and $125 with psoralen, UVA, and acitretin.

The average costs to achieve a 75% PASI improvement were $6,442 with acitretin 25, $21,097 with acitretin 50, $7,685 with cyclosporine 1.25, $6,029 with cyclosporine 3.0, $2,611 with methotrexate 7.5, $9,708 with methotrexate 15, $18,386 with adalimumab, $35,096 with alefacept, $33,272 with efalizumab, $15,109 with etanercept 25, $25,067 with etanercept 50, $20,486 with infliximab, $7,342 with UVB, $7,013 with psoralen and UVA, and $9,371 with psoralen, UVA, and acitretin.

Authors' conclusions
The authors concluded that their cost-effectiveness estimates ranged from a low of $2,611 per clinical improvement with methotrexate 7.5mg weekly to a high of $35,096 with alefacept 15mg weekly and the relative positioning of oral medications, phototherapy, and biologic agents had not changed since their previous analysis.

CRD commentary
Interventions:
The selection of the comparators was appropriate as all available treatments for moderate-to-severe psoriasis were considered. The dosages were reported.

Effectiveness/benefits:
Details of the methods and conduct of the review were clearly presented. The authors gave their reasons for the exclusion of some trials and considered only similar and valid sources of data. RCTs are generally considered to be valid sources, due to their methods. The authors justified their selection of the PASI as the benefit measure as it captures several aspects of psoriasis and was recommended by the US Food and Drug Administration (FDA) as the preferred outcome measure for psoriasis treatment. This measure does not allow the identification of the most cost-effective treatment as no consensus exists on the optimal threshold for a one-point percentage improvement in the PASI.

Costs:
The authors stated that the perspective of a managed health care organisation was adopted and the analysis, therefore, only included the direct medical costs. The unit costs and quantities of resources were only reported for a few items. The authors acknowledged that the drug dosages might not reflect real-world consumption, but they were based on clinical trial data. The cost estimates were treated deterministically, and variations in them were not assessed.

Analysis and results:
The results were clearly reported. Average cost-effectiveness ratios were calculated and no direct comparison, based on an incremental analysis, was performed. The uncertainty was not investigated. The authors pointed out that these findings corroborated their previous findings and those of another study comparing various treatments for psoriasis. Some limitations were acknowledged, such as the exclusion of costs and effects associated with adverse events, and the need to extrapolate short-term outcomes to the one-year time horizon.

Concluding remarks:
The study was based on a valid review of the literature and a transparent economic analysis, but the robustness of the authors' conclusions was not assessed in a sensitivity analysis.

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