Treatments for mild-to-moderate recalcitrant plaque psoriasis: expected clinical and economic outcomes for first-line and second-line care


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
The study compared first- and second-line therapies for the treatment of psoriasis. First-line therapy consisted of a topical corticosteroid for localised psoriasis plus calcipotriene. The second-line therapies that were compared in the study were:

- tazarotene plus corticosteroid,
- psoralen plus ultraviolet A (PUVA) phototherapy,
- ultraviolet B (UVB) phototherapy,
- anthralin plus corticosteroid,
- intralesional corticosteroid injections (ICI), and
- a 308-nm excimer laser (XTRAC; PhotoMedex, Montgomeryville).

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients with mild-to-moderate psoriasis. Further inclusion and exclusion criteria were not reported.

Setting
The setting, although not explicitly stated, was the community. The economic study was carried out in the USA.

Dates to which data relate
The effectiveness data were derived from studies published between 1981 and 2003. The cost data were derived from official sources published between 1998 and 2003. The price year was not explicitly reported, but the prices seem to have been from the fiscal year 2003.

Source of effectiveness data
The effectiveness data were derived from a review and synthesis of published data. Where data in the literature were not available, they were augmented by the authors' opinions, which were based on their clinical experience.
Modelling
A decision analytic disease-intervention model was constructed to assess the clinical and economic outcomes of the treatment options using DATA (TreeAge Software). The model was constructed according to the recommendations of the American Academy of Dermatology for care of patients with psoriasis. The time horizon of the model was one year. Due to a lack of accurate data in the literature it was assumed that an equal proportion of patients who did not respond to first-line therapy would be treated with each of the second-line treatment options. It was also assumed that patients who would not respond to the first-choice second-line treatment option would continue treatment with a different second-line treatment strategy.

Outcomes assessed in the review
The following input parameters were used in the model:

the success rate of each treatment option, measured as percentage improvement in the physical signs and symptoms of the disease;

the duration of success of each treatment option;

the duration of each treatment regimen; and the duration of the maintenance regimen of each treatment option.

In addition, adverse events and the probability of each adverse event, as well as the management strategy to deal with each adverse event in each treatment option, were also included in the model.

Study designs and other criteria for inclusion in the review
Not reported.

Sources searched to identify primary studies
Not reported.

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

Methods used to judge relevance and validity, and for extracting data
Not reported.

Number of primary studies included
Overall, 8 primary studies provided the primary data.

Methods of combining primary studies
The authors do not seem to have combined the results of the individual studies.

Investigation of differences between primary studies
The authors do not seem to have investigated differences between the primary studies.

Results of the review
The success rate and the duration of remission were, respectively:
for the excimer laser, 72% and 20 weeks;
for UVB phototherapy, 62.5% and 12 weeks;
for PUVA phototherapy, 80% and 22 weeks;
for calcipotriene plus corticosteroid, 77% and 9 weeks;
for ICI, 75% and 16 weeks;
for anthralin plus corticosteroid, 81% and 13 weeks; and
for tazarotene plus corticosteroid, 65% and 13 weeks.

In the case of UVB phototherapy, PUVA phototherapy, calcipotriene plus corticosteroid, anthralin plus corticosteroid, and tazarotene plus corticosteroid, the remission was with maintenance.

The results in relation to the treatment regimen and the maintenance regimen for each treatment option were too numerous to report here (the reader is referred to Table 3 of the original modelling study).

The probabilities of adverse events were:
for excimer laser, mild sunburn-like reaction 14%, blister 42% and pain 13%;
for UVB phototherapy, itching 12% and burns 41%;
for PUVA phototherapy, itching 13%, burns 80%, nausea 10%, squamous cell carcinoma and melanoma 0%;
for calcipotriene plus corticosteroid, hypercalcaemia 100%, skin infection 3%, pruritus 4.90% and folliculitis 0.50%;
for ICI, none;
for anthralin plus corticosteroid, none; and
for tazarotene plus corticosteroid, pruritus 32%.

Methods used to derive estimates of effectiveness
Where data in the literature were not available, the effectiveness estimates were derived using authors' opinions, based on their clinical experience.

Estimates of effectiveness and key assumptions
The following input parameters of the model were based on authors' clinical assessments:

the success rate and duration of remission with excimer laser, PUVA phototherapy and ICI; and

the treatment and maintenance regimens for excimer laser, PUVA phototherapy, calcipotriene plus corticosteroid, ICI, anthralin plus corticosteroid, and tazarotene plus corticosteroid.

Measure of benefits used in the economic analysis
The measures of benefit used were the number of treatment-free days and the number of remission days. These outcomes were obtained from the model.

Direct costs
The health care costs included in the analysis were the cost of the drugs, the cost of phototherapy treatment using either excimer laser, UVB or UVA, the cost of the overall treatment regimen for each treatment option, the costs of the initial physician visit and the follow-up physician visit, and the costs of treating each adverse event. The drug costs covered calcipotriene plus betamethasone, ICI with triamcinolone acetonide, PUVA phototherapy using methoxsalen capsules, anthralin plus clobetasol, and tazarotene plus clobetasol. The costs and the quantities were reported separately. All the costs were derived from resource costs found in the Redbook (drug costs) and Physician Fee Schedule (Medicare reimbursement based on procedural codes), and also from clinical assessment. The costs seem to have been appropriately inflated and reported for the price year 2003. Since the costs were incurred during a short time period (less than two years), discounting was not relevant. The total expected per-patient cost for one year of care was reported.

**Statistical analysis of costs**
The costs were treated deterministically.

**Indirect Costs**
The indirect costs were not included in the analysis.

**Currency**
US dollars ($).

**Sensitivity analysis**
No sensitivity analysis was carried out.

**Estimated benefits used in the economic analysis**
The estimated benefits used in the economic analysis were not reported separately.

**Cost results**
The total annual cost including first- and second-line therapies was $2,340 when including the laser option and $2,342 without the laser option.

The total per-patient annual cost for first-line therapy followed by one second-line therapy was $2,035 for ICI, $2,335 for excimer laser, $2,653 for UVB phototherapy, $2,732 for PUVA phototherapy, $2,034 for anthralin plus corticosteroid, and $2,254 for tazarotene plus corticosteroid.

**Synthesis of costs and benefits**
When first-line therapy was followed by only one second-line therapy option, the cost per treatment-free day was $35.53 for ICI, $41.61 for excimer laser, $56.56 for UVB phototherapy, $47.37 for PUVA phototherapy, $291.92 for anthralin plus corticosteroid, and $99.92 for tazarotene plus corticosteroid.

The expected cost per remission day was $9.65 for ICI, $10.73 for excimer laser, $13.10 for UVB phototherapy, $13.16 for PUVA phototherapy, $9.89 for anthralin plus corticosteroid, and $10.92 for tazarotene plus corticosteroid.

**Authors' conclusions**
The addition of the excimer laser to the group of available second-line therapies for the treatment of patients with mild-to-moderate plaque psoriasis who are resistant to first-line therapy provides sizeable clinical benefits, reduces the number of treatment sessions and treatment days, and might increase patient satisfaction without imposing additional costs to the payers.
CRD COMMENTARY - Selection of comparators
The selection of the comparators was explicitly justified. The authors justified their choice with reference to clinical practice recommendations by the American Academy of Dermatology. You should decide if they represent widely used health technologies in your own setting.

Validity of estimate of measure of effectiveness
A systematic review of the literature was not undertaken. Although this is common practice with models, it does not always ensure that the best data available are used in the model. The authors appear to have used data from the available studies selectively. In addition, they did not consider the impact of differences between the studies when estimating effectiveness. Some estimates of effectiveness were augmented by the authors’ opinions, based on their clinical experience. The authors did not refer to any methods used to investigate effectiveness, and the estimates used were not investigated in a sensitivity analysis.

Validity of estimate of measure of benefit
The authors used treatment-free days and days of remission as measure of benefit, these being derived directly from the model. These measures of benefit were appropriate for the type of intervention under analysis. However, the authors did not report the estimated benefits. These measures of benefit do not enable comparisons across health technologies.

Validity of estimate of costs
The analysis of the costs was performed from the perspective of the payer. It appears that all the relevant categories of costs have been included in the analysis. The costs and the quantities were reported separately, thus enhancing the reproducibility of the study in other settings. However, the costs were treated deterministically and no sensitivity analysis was conducted on the costs and quantities, introducing possible uncertainty into the results. The cost inflation performed was appropriate and, since all the costs were incurred during one year, discounting was not necessary.

Other issues
The authors did not compare their findings with those from other studies, so it is not known how far their results agree with other published results. In addition, the authors did not directly address the issue of the generalisability of the results to other settings. The study enrolled patients with mild-to-moderate plaque psoriasis and this was reflected in the authors' conclusions. The results of the study do not seem to have been presented selectively. The authors did not report any limitations to their study.

Implications of the study
The authors did not make any explicit recommendations for changes in policy or practice, or the need for further research.

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Bibliographic details

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