Cost-effectiveness of the two-compound formulation calcipotriol and betamethasone dipropionate compared with commonly used topical treatments in the management of moderately severe plaque psoriasis in Scotland


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 five treatment options for plaque psoriasis.

Option 1 was the two-compound formulation (TCF), first-choice, once daily for 4 weeks, followed by TCF, second-choice, once daily for 4 weeks.

Option 2 was calcipotriol, first-choice, once daily for 4 weeks, followed by potent steroid (betamethasone dipropionate, BDP), second-choice, daily for 4 weeks.

Option 3 was calcipotriol, first-choice, twice daily for 4 weeks, followed by potent steroid (BDP), second-choice, daily for 4 weeks.

Option 4 was potent steroid (BDP), first-choice, daily for 4 weeks, followed by calcipotriol, second-choice, once daily for 4 weeks.

Option 5 was concurrent calcipotriol, first-choice, once daily (morning) and potent steroid (BDP) once daily (evening) for 4 weeks, followed by the same regimen, second-choice, for a further 4 weeks.

Type of intervention
Treatment.

Economic study type
Cost-utility analysis

Study population
The study population included patients with moderately serve plaque psoriasis vulgaris. No further details of the study population were provided.

Setting
The setting was primary and secondary outpatient care. The economic study was carried out in Scotland.

Dates to which data relate
The effectiveness data used to populate the model came from studies published between 1997 and 2004. The quantities of drugs used were taken from the same series of studies, although it was unclear to what dates the other resources used related. The price year appears to have been 2007.

Modelling
A Markov chain model was used to model the progression of psoriasis patients through response or non-response to 4 weeks' treatment with the different topical agents. The time horizon was 1 year. The health states and cycle length were presented in full, along with a number of modelling assumptions which were fully justified.
Study designs and other criteria for inclusion in the review
The effectiveness data included in the model were the proportion of patients in whom a 75% or greater reduction in the Psoriasis Area and Severity Index (PASI) relative to baseline was achieved from the five treatment options. The number of patients on the waiting list for specialist treatment and the number of patients who had received phototherapy were also included.

Sources searched to identify primary studies
Data on the number of patients who achieved at least a 75% reduction in the PASI were derived from seven randomised controlled trials (RCTs). Information on the number of patients on waiting lists and the number who had received phototherapy was obtained from the NHS Scotland waiting time database.

Methods used to derive estimates of effectiveness
The authors reported that a systematic literature search of MEDLINE, EMBASE and SciSearch from 1951 to 2005 was conducted to identify the estimates of effectiveness. Eligible trials included RCTs using PASI and PASI-75 efficacy measures. Crossover studies were excluded.

Measure of benefits used in the economic analysis
The measure of benefit used was the quality-adjusted life-years (QALYs) gained. The utility values associated with psoriasis status (baseline, achievement of PASI >= 75, achievement of PASI < 75, on waiting list for phototherapy) were mainly obtained from published studies, although the authors assumed that the utility whilst on a waiting list for phototherapy was the same as that prior to treatment.

Direct costs
The direct costs included were those to the health care system. These were for treatment, general practitioner consultation, specialist outpatient consultant consultation, specialist outpatient nurse consultation and nurse-led phototherapy course. The costs were taken from published sources, generally those related to the costs of health care in Scotland between 2006 and 2007. While the quantity of drugs used under each treatment option were obtained from the RCTs that provided the effectiveness data, the other resource use quantities appear to have been based on assumptions. The costs and the quantities were reported separately. Discounting was not performed, but was not necessary given the relatively short duration of follow-up.

Statistical analysis of costs
The costs were treated as point estimates.

Indirect Costs
Productivity costs were not included.

Currency
UK pounds sterling (£).

Sensitivity analysis
Sensitivity analyses were performed to determine the effect on the outcomes of variables used in the model. Specifically, the costs of phototherapy, amount of TCF used, baseline utility, utility on the waiting list, PASI >= 75 per treatment option, magnitude of utility gain associated with response and non-response, response to phototherapy, relapse rate of the comparators, duration of the waiting list, the topical prescribed while awaiting phototherapy, and the use of potent steroid other than the least costly and most commonly used.

Estimated benefits used in the economic analysis
The mean QALYs gained were:

0.857 for option 1 (TCF),

0.844 for option 2 (calcipotriol once daily followed by potent steroid),

0.846 for option 3 (calcipotriol, twice daily followed by potent steroid),
0.845 for option 4 (steroid followed by calcipotriol once daily), and
0.839 for option 5 (calcipotriol and steroid followed by calcipotriol and steroid).

Cost results
The annual costs per patient were:

£453.52 for option 1,
£591.48 for option 2,
£550.18 for option 3,
£586.37 for option 4, and
£729.93 for option 5.

Synthesis of costs and benefits
The authors showed that the intervention (treatment option 1, TCF) was the dominant strategy since it was less costly and more effective than all alternatives.

The sensitivity analyses showed that the cost of phototherapy, the cost of TCF, baseline utility and utility on the waiting list had the greatest impact on the results. TCF became dominant over the other comparators around a phototherapy course cost of £400 and above. If patients receiving TCF applied a maximum possible dose of 100 g of product per week, while patients on all the other comparators received average use of these products, the incremental cost-effectiveness ratio (ICER) would be between £11,000 and £32,000. If baseline utility fell below 0.725, the TCF incremental cost per QALY gained would exceed £20,000, while if the waiting list utility was higher than 0.875, the ICER exceeded £20,000 per QALY gained.

Authors' conclusions
The authors concluded that the use of the two-compound formulation (TCF) in patients with plaque psoriasis represents excellent value for money in Scotland.

CRD COMMENTARY - Selection of comparators
A justification was provided for the treatments compared. They are commonly used for the treatment of plaque psoriasis in Scotland. You should decide if they represent valid comparators in your own setting.

Validity of estimate of measure of effectiveness
The authors conducted a systematic search of the literature for clinical evidence, so it is quite possible that the best available evidence was identified. The studies identified were referenced. The included Leo Pharma-sponsored RCTs potentially have a high level of internal validity.

Validity of estimate of measure of benefit
The estimation of health benefits (QALYs) was modelled. The EQ-5D instrument, which was used to identify utilities, is appropriate for the UK setting. The other methods used to estimate utility weights were not described since they were taken from published sources and, in one case, from expert opinion. You should consider if a 1-year time horizon is adequate to capture the differences in the health benefit of the treatments.

Validity of estimate of costs
The analysis of the costs was performed from the perspective of the NHS paying for the treatment. It appears that all the relevant categories of costs have been included in the analysis. While the source of the unit cost data was reported, it was unclear where some of the resource use data came from. Uncertainty in a limited amount of the cost data was evaluated jointly with the effectiveness data. The costs were not discounted because they were incurred during 1 year.
The cost estimates would appear to be relevant to the study population and setting.

**Other issues**
The authors did not compare their findings with those from other studies, although this was probably due to the lack of studies comparing the cost and effectiveness of TCF and other commonly used treatments for plaque psoriasis. The issue of generalisability to other settings was generally addressed through the sensitivity analysis, although not all of the cost data were subjected to sensitivity analysis. The authors do not appear to have presented their results selectively. The study was concerned with patients with moderately severe plaque psoriasis and this was reflected in the authors' conclusions. The authors reported a number of limitations to their study. For example, the absence of a direct, prospective lifetime evaluation of treatments available for psoriasis meant that an indirect comparison of a number of studies had to be used.

**Implications of the study**
TCF appears to be the preferred option for the treatment of patients with plaque psoriasis as it is associated with an improvement in patient outcomes at a reduced cost to the NHS.

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