Cost-effectiveness and cost-benefit analysis of using methotrexate vs Goeckerman therapy for psoriasis: a pilot study

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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
The use of methotrexate versus Goeckerman therapy for psoriasis.

Type of intervention
Treatment.

Economic study type
Cost-utility analysis and cost-benefit analysis.

Study population
Patients with mild, moderate or severe psoriasis.

Setting
Hospital. The study was carried out in the USA.

Dates to which data relate
Effectiveness data were collected from studies published between 1966 and 1994. Cost data were collected from 1996-1998 sources. The price year was not explicitly reported but is likely to have been 1998.

Source of effectiveness data
Effectiveness data were derived from a literature review.

Modelling
A decision analytic model was used to determine the cost-effectiveness and cost-benefit of the three treatment strategies.

Outcomes assessed in the review
The review assessed the efficacy rate of methotrexate and Goeckerman therapy.

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

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

Methods used to judge relevance and validity, and for extracting data
Summary statistics from individual studies.

Number of primary studies included
At least 8 studies were included in the review.

Methods of combining primary studies
Not stated.

Investigation of differences between primary studies
Not stated.

Results of the review
The authors assumed a base-case Goeckerman efficacy rate of 90% for severe and moderate psoriasis and 100% for mild psoriasis. Methotrexate efficacy was 62.5%. Liquid methotrexate was assumed to have the same efficacy as the tablet form.

Measure of benefits used in the economic analysis
Utilities and willingness to pay (WTP) were used as the measures of benefit. Utilities were assessed with the WTP and Visual Analog Score (VAS) methods. Three populations provided utility estimates: patients with psoriasis (n=15), faculty and residents in the Department of Dermatology at Stanford University (16 dermatologists), and a convenience sample of people who were neither patients with the disease nor physicians involved in its treatment (n=27).

Direct costs
Direct costs were not discounted given the short time frame of the study (less than 1 year). Quantities and costs were not reported separately. Direct costs reflected the costs for supplies, laboratory tests, medications, physicians’ professional fees and hospital fees. The quantity/cost boundary adopted was that of the health service. The estimation of quantities and costs was based on data reflecting actual consumption of resources at appropriate departments at Stanford University. Physicians’ professional fees and hospital fees were based on 1996 Medicare reimbursement levels. The outpatient pharmacy at Stanford University provided average wholesale prices from the 1998 Drug Topics Red Book. The price year was not clearly reported.

Statistical analysis of costs
Not reported.

Indirect Costs
Not included.

Currency
Sensitivity analysis
Sensitivity analyses were performed on the efficacy of both Goeckerman therapy and methotrexate, the costs of providing these therapies, and utilities.

Estimated benefits used in the economic analysis
Differences in WTP were found in each of the different levels of disease severity and therapies after allowing for the effect of differences from other variables, \( p=0.001 \). A difference in WTP was found between severe and mild \( p=0.001 \) as well as severe and moderate \( p=0.002 \) psoriasis, but no difference was detected between moderate and mild psoriasis. There was a difference in WTP between cure and methotrexate as well as between cure and Goeckerman \( p=0.001 \), but no difference was found between Goeckerman and methotrexate. There was a difference between patients and dermatologists \( p=0.02 \) as well as society and dermatologists \( p=0.006 \), but not between society and patients. Differences in VAS were found between severity levels \( p=0.001 \) and between respondent groups \( p=0.04 \). There were also significant differences \( p=0.001 \) between mild and severe, mild and moderate, and moderate and severe psoriasis. There were differences in VAS between dermatologists and patients \( p=0.02 \) as well as dermatologists and society \( p=0.04 \), but not between society and patients.

Cost results
Costs were not presented separately.

Synthesis of costs and benefits
The cost of Goeckerman always exceeded the monetary value of its benefits, as measured by WTP. The cost of methotrexate tablets exceeded the benefits, except in the case of severe psoriasis using utilities from the society group. The benefit of liquid methotrexate exceeded the cost for severe psoriasis in all groups. The net benefit was greatest for liquid methotrexate and was least for Goeckerman. When compared with no therapy, Goeckerman and both forms of methotrexate were always cost-effective. Liquid methotrexate dominated the tablet form. When compared with liquid methotrexate, Goeckerman was not cost-effective in the mild or moderate psoriasis except when using utilities from the patient group. For severe psoriasis, Goeckerman was cost-effective across all respondent groups. Goeckerman was always cost-effective compared with liquid methotrexate using utilities from the patient group. Using utilities from society and dermatologists, Goeckerman was cost-effective against liquid methotrexate only in severe psoriasis. The cost-effectiveness ratio of Goeckerman to methotrexate was sensitive to the efficacy of methotrexate and varied slightly with the efficacy of Goeckerman. The cost-effectiveness ratios were sensitive to variations in utility.

Authors’ conclusions
Liquid methotrexate should be offered instead of the tablet form if the efficacy of both is truly comparable. However, it is premature to offer general policy recommendations for Goeckerman and methotrexate based on these analyses.

CRD COMMENTARY - Selection of comparators
The rationale for the choice of the comparators was clear. You, as a user of this database, should verify whether these health technologies are relevant to your setting.

Validity of estimate of measure of benefit
Relevant measures of benefit were used. The authors used both effectiveness measures and willingness to pay measures. Utility values were elicited from different populations. The effectiveness data have been derived from, what may have been, a non-systematic review of the literature and the internal validity of effectiveness estimates cannot be fully assessed given the limited information provided about the literature review and the quality assessment of the primary studies. The authors observed a tendency for subjects to be overly focused on the disease presented. Hence, subjects
rated their utilities too low on the vertical rating scale. Also a larger and more general population needs to be approached when reassessing utilities. The authors acknowledged the lack of data on the efficacy of both methotrexate and Goeckerman therapy. They also recognised that most psoriasis severity scores reported in clinical studies would be different from those used in this study.

Validity of estimate of costs
Only direct costs were considered. Indirect costs, such as those related to lost productivity, were not included. Some cost estimates were based on charges and, hence, do not reflect true opportunity costs. All costs were derived from Stanford University Hospital and, hence, are unlikely to be generalisable to other institutions.

Other issues
The authors undertook comprehensive analyses using two methods of economic evaluation in an under-researched field and offer a means of further refining their initial work. Adequate comparisons with other relevant studies were made. The generalisability of the results to other settings and countries was discussed and the authors do not appear to have presented their results selectively. The study enrolled patients with psoriasis and this was reflected in the authors’ conclusions.

Implications of the study
More work is needed on the assessment of methotrexate and Goeckerman efficacy and on utilities.

Source of funding
None stated.

Bibliographic details

PubMedID
9875201

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Cost-Benefit Analysis; Dermatologic Agents /economics /therapeutic use; Humans; Methotrexate /economics /therapeutic use; Pilot Projects; Psoriasis /therapy; Sensitivity and Specificity; Ultraviolet Therapy /economics

AccessionNumber
21999000134

Date bibliographic record published
31/08/2000

Date abstract record published
31/08/2000