Health economic impact of olopatadine compared to branded and generic sodium cromoglycate in the treatment of seasonal allergic conjunctivitis in the UK

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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 study examined three treatments for seasonal allergic conjunctivitis (SAC). These were olopatadine (OLO), generic sodium cromoglycate (GSC) and branded sodium cromoglycate (BSC). OLO was administered as one drop in the affected eye twice daily, while BSC and GSC were given as one or two drops in the affected eye four times daily.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised a hypothetical cohort of patients with SAC who were aged 4 years or older.

Setting
The setting was primary care. The economic study was carried out in the UK.

Dates to which data relate
The effectiveness data were derived from studies published in 2002 and in 2005. No dates for the resource use data were reported. The costs were valued using 2004/05 prices.

Source of effectiveness data
The clinical data used in the decision model were the switching patterns amongst treatments and the success rates at different time points (7, 14, 28, 42 and 120 days).

Modelling
A decision tree was constructed to simulate treatment with the three strategies in a hypothetical cohort of individuals with SAC. Patients started with a treatment, and then those with unsuccessful treatment switched to an alternative ocular anti-inflammatory drug. The time horizon of the model was 4 months. The pathways of the decision model were depicted and the probabilities of events were reported.

Sources searched to identify primary studies
Switching patterns were derived from UK market share of drugs prescribed for SAC in primary care. The success rates at 7, 14, 28 and 42 days were derived from a multi-country, double-blind RCT. The success rates with OLO and GSC (or BSC) at 120 days were obtained by extrapolating the successful treatment rates at the last three points in the trial.
using linear regression.

**Methods used to judge relevance and validity, and for extracting data**
The primary studies were identified through a systematic review of the literature. The search strategy was not limited by year of publication, but was restricted to English-language papers. Only one study assessing successful rates of the two alternative treatments for SAC was found, and this was used to populate the decision model.

**Measure of benefits used in the economic analysis**
No summary benefit measure was used in the economic analysis as a cost-minimisation analysis was performed.

**Direct costs**
The analysis was carried out from the perspective of the NHS. It included the costs of the drugs and general practitioner (GP) and ophthalmologist visits. The unit costs and the resource quantities were reported separately. Resource use was estimated on the basis of authors’ assumptions and expert opinion. The costs were estimated using the Personal Social Services Research Unit, NHS Executive Reference Costs and the British National Formulary. Discounting was not relevant because of the short timeframe of the analysis (4 months). The costs were evaluated using 2004/05 prices. A budget impact analysis was also performed using UK prevalence data on SAC.

**Statistical analysis of costs**
The costs were treated deterministically in the base-case. The resource quantities were presented as mean values with standard deviations.

**Indirect Costs**
Productivity costs were not included.

**Currency**
UK pounds sterling (€).

**Sensitivity analysis**
A univariate sensitivity analysis was carried out to assess the robustness of the cost estimates to variations in model inputs such as probability values, quantities of resources used and unit costs. A probabilistic sensitivity analysis was also performed by running 1,000 iterations of the model. Probabilistic distributions were assigned to all model inputs and were described.

**Estimated benefits used in the economic analysis**
Not relevant since no statistically significant differences were found in success rates between the alternatives compared at 42 or 120 days. However, it should be noticed that statistically significant differences in success rates were found at 7, 14 and 28 days in favour of OLO. This would appear to be a key driver for the reduction in resource consumption in OLO-treated patients.

**Cost results**
The total costs per patient over 4 months were 91.81 (95% confidence interval, CI: 46 to 150) with OLO, 108.59 (95% CI: 65 to 166) with BSC and 94.62 (95% CI: 51 to 152) with GSC. This cost-difference was mainly due to fewer GP visits among OLO-treated patients.

The probabilistic sensitivity analysis showed that the use of OLO instead of BCS or GCS led to a reduction in costs of
17 and 3, respectively. The use of GCS instead of BCS led to a cost-reduction of 14.

The deterministic sensitivity analysis suggested that the expected costs were sensitive to changes in the probability of successful treatment at different time points, the number of repeat GP visits in successfully treated patients, and the number of repeat GP visits in patients who switch treatment after 14 days. Changes in other model inputs did not substantially alter the conclusions of the analysis.

The budget impact analysis showed that, depending on the proportions of patients receiving OLO instead of BCS or GCS, cost-savings were expected from the perspective of the NHS. Such cost-savings were mainly due to the reduction in repeated GP visits. For example, given the current incidence rate, if all patients currently receiving BSC or GCS would instead receive OLO as first-line treatment, the number of repeated visits would be in the range of 6.8 to 8.7 million instead of 7.9 to 10.5 million.

**Synthesis of costs and benefits**

A synthesis of the costs and benefits was not relevant since a cost-minimisation analysis was performed.

**Authors' conclusions**

The use of olopatadine (OLO) instead of branded sodium cromoglycate (BSC) and generic cromoglycate (GSC) for the treatment of seasonal allergic conjunctivitis (SAC) led to 16% and 3% reductions in health care costs, respectively, over a 4-month period. Therefore, given its similar efficacy and toxicity profile, the authors stated that OLO was the most cost-effective treatment for SAC in the UK.

**CRD COMMENTARY - Selection of comparators**

The choice of the comparators appears to have been appropriate and reflected typical patterns of care in the UK. Switching patterns were described in detail. You should decide whether they are valid comparators in your own setting.

**Validity of estimate of measure of effectiveness**

The authors reported some information on the method and conduct of the review of the literature that was undertaken to identify primary studies. Only two studies provided the clinical data, and details of these were given. In particular, the use of a well-conducted RCT should have ensured the validity of the primary data. The data were not pooled, each source providing a series of estimates that were used to populate the decision model.

**Validity of estimate of measure of benefit**

No summary benefit measure was used in the analysis as a cost-minimisation analysis was conducted. The authors stated that similar efficacy and toxicity profiles between treatments were found at the end of follow-up. However, the use of different success rates for OLO with respect to BSC or GSC at different time points determined resource consumption and thus the relative cost-effectiveness. Please refer to the comments in the 'Validity of estimate of measure of effectiveness' field (above).

**Validity of estimate of costs**

The analysis of the costs was consistent with the perspective stated in the study objective. All the relevant categories of costs appear to have been included. Information on the unit costs, quantities of resources used and the price year was provided, which will help in replicating the analysis in other settings and time periods. Statistical analyses of the costs and quantities were performed in the sensitivity analysis. The impact of alternative cost estimates was also investigated. The sources of the costs were reported; they would appear to represent typical NHS sources. Resource consumption was estimated entirely on the basis of authors' assumptions.

**Other issues**

The authors stated that OLO had been found to be a cost-effective treatment for SAC in other European countries. The
issue of the generalisability of the study results to other settings was explicitly addressed in the sensitivity analysis. The authors noted that one of the main limitations of the analysis was the use of a single source to derive data on treatment effectiveness, which was one of the model inputs with the greatest impact on total costs. This introduces some uncertainty in the results of the simulation. In addition, it should be noted that the CIs around the mean cost estimates were large and that there was an overlap between treatments.

**Implications of the study**
The authors suggest that, even with the limitation of the modelling exercise, OLO might be considered as the preferred first-line treatment for SAC.

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