Cost-effectiveness of latanoprost and timolol maleate for the treatment of glaucoma in Scandinavia and the United Kingdom, using a decision-analytic health economic model

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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
The objective was to examine the long-term cost-effectiveness of latanoprost versus timolol as monotherapy for the treatment of open-angle glaucoma in Scandinavia (Sweden, Norway and Denmark) and the UK. Timolol was a cost-effective strategy in the UK. But in Scandinavia, Latanoprost could be cost-effective compared with Timolol. Overall, the study was based on a valid methodology, but was not extensively reported. Thus, the authors’ conclusions should be treated with some caution.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective was to examine the long-term cost-effectiveness of latanoprost versus timolol as monotherapy for the treatment of open-angle glaucoma.

Interventions
The two strategies were latanoprost and timolol monotherapy. Patients who discontinued timolol were switched to latanoprost, and vice versa.

Location/setting
Scandinavia (Norway, Sweden and Denmark) and the UK/secondary care.

Methods
Analytical approach:
This economic evaluation was based on a Markov model with a five-year time horizon. The authors did not explicitly report the perspective of the study.

Effectiveness data:
The clinical data were derived from a systematic review of the literature in the PubMed electronic database. Specific information for each country was used whenever possible. No information on the design or other characteristics of the primary studies was reported. The issue of heterogeneity among the sources of data was not addressed. Some assumptions were required and were reported. The primary clinical outcome was prevention of disease progression defined by further thinning of the optic nerve or worsening of the visual field.

Monetary benefit and utility valuations:
The utility valuations were derived from previous studies (the details of which were not given) supplemented with the authors’ assumptions.

Measure of benefit:
Quality-adjusted life-years (QALYs) were used as the summary benefit measure.

Cost data:
The economic analysis included the costs of medications, patient visits, diagnostics and therapeutic procedures. The unit costs were derived from country-specific sources and were reported for most items. The resource use data were
based on surveys of practising ophthalmologists in each country. The details of resource consumption were not given. All costs were in local currencies: Swedish Kronor (SEK), Danish kroner (DKK), Norwegian Kroner (NOK) and UK pounds sterling (£). These currencies were converted to US dollars ($) at the exchange rate for 31 December 2005.

Analysis of uncertainty:
A deterministic sensitivity analysis was undertaken on the following model inputs: the cost of latanoprost; cost of routine visit; and cost of blindness. Each input was varied by plus or minus 10 per cent of the baseline value.

Results

**Expected QALYs:** in Norway were 3.9733 with latanoprost and 3.9796 with timolol; in Sweden were 3.9548 with latanoprost and 3.9583 with timolol; in Denmark were 4.0183 with latanoprost and 4.0251 with timolol; and in the UK 4.0227 with latanoprost and 4.0378 with timolol.

**Expected costs:** in Norway were $5,694 with latanoprost and $6,018 with timolol; in Sweden were $5,391 with latanoprost and $5,818 with timolol; in Denmark were $4,595 with latanoprost and $4,976 with timolol; and in the UK $5,676 with latanoprost and $5,799 with timolol.

The incremental cost per QALY gained with timolol over latanoprost was in Norway $51,831, in Sweden $124,270, in Denmark $55,722 and in the UK $8,175.

The sensitivity analysis confirmed that these base-case findings were robust.

Authors' conclusions
The authors concluded that timolol was cost-effective in the UK, but Latanoprost could be cost-effective compared with timolol in Scandinavia.

CRD commentary

**Interventions:**
The authors justified their selection of the comparators: worldwide, timolol was the most commonly used first-line agent for the treatment of glaucoma; and latanoprost was the first available prostaglandin analogue.

**Effectiveness/benefits:**
A systematic literature review was performed in order to obtain clinical data, but the methodology and conduct of this review were not reported. The basic characteristics of the primary data sources (the study population, design, follow-up and so on) were not given, although it appears from the references that the data on treatment effect were obtained from randomised controlled trials. The lack of explicit details on the sources for these data meant that an objective assessment of the validity of the clinical inputs was not possible. Similarly, little information on the derivation of the utility valuations was provided. QALYs are a validated benefit measure allowing cross-disease comparisons.

**Costs:**
The authors did not explicitly report the viewpoint of the economic analysis. However, the categories of costs suggested that the perspective of the health service payer was adopted. A breakdown of cost items was provided, but information on the resource consumption was not given, although resource use was likely to have reflected real-world patterns in each country. The authors did not describe the sources used to derive the unit costs. The price year was not explicitly reported. The use of discounting was not reported, although it could have been relevant as the long-term costs were calculated. In general, the economic analysis was not extensively described.

**Analysis and results:**
The synthesis of the costs and benefits was appropriately performed by means of an incremental analysis. The results of the base-case analysis were clearly presented. The issue of uncertainty was only partially addressed given that the sensitivity analysis considered variations in the key economic inputs individually. The authors noted that some assumptions were necessary in order to simplify the decision model, which may have reduced the accuracy of the simulation. The authors compared their results with those from other studies and highlighted the reasons for some differences.
Concluding remarks:
Overall, the study was based on a valid methodology, but was not extensively reported and the analysis of uncertainty was limited. Thus, the authors’ conclusions should be treated with some caution.

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