Prostaglandin analogues for ophthalmic use: a cost-effectiveness analysis

Lachaine J, Hodge W G, Steffensen I, Murray C, Barnes D, Foerster V, Ducruet T, Mensinkai S

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
This study determined the cost-effectiveness of prostaglandin analogues for the treatment of increased intraocular pressure (IOP) in adults (over 18 years) with raised IOP, who were being treated with a glaucoma medication. Latanoprost was more cost-effective than dorzolamide or brimonidine, but neither latanoprost nor travoprost was cost-effective compared with timolol. There was uncertainty as to whether the best available clinical evidence was used and whether the cost analysis was appropriately conducted. The authors’ conclusions should be considered with caution.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to determine the cost-effectiveness of prostaglandin analogues for the treatment of increased intraocular pressure (IOP) in adult patients (over 18 years) with raised IOP, who were being treated with a prostaglandin analogue or another glaucoma medication that was available in Canada.

Interventions
Latanoprost was compared with timolol, dorzolamide, or brimonidine, in three separate analyses. In a fourth analysis, travoprost was compared with timolol.

Location/setting
Canada/secondary care.

Methods
Analytical approach:
For the four analyses, a decision tree was constructed to determine the distribution of the health outcomes in the study population. The time horizon was three months. The authors stated that the perspective was that of a public third-party payer (the Ministry of Health).

Effectiveness data:
The clinical effectiveness estimates were taken from the literature, based on a review. The main parameters were the number of millimetres of mercury reduction in IOP compared with baseline, and the incidence of adverse events, which resulted in a withdrawal of the patient from the study.

Monetary benefit and utility valuations:
Not relevant.

Measure of benefit:
The primary outcome was the change in IOP from baseline to three months. The change in IOP at six and 12 months was also analysed.

Cost data:
The cost categories included the costs of medication, ophthalmologists’ fees, and the handling of adverse events. The costs of medication were estimated from the Ontario Drug Benefit Formulary 2005. The ophthalmologists’ fees were taken from the Ontario Schedule of Benefits for Physician Services 2007. These costs were reported in US dollars ($) and they were not discounted as the time-horizon was less than a year.
Analysis of uncertainty:
Probabilistic sensitivity analyses were conducted on the reduction in IOP, using the 95% confidence interval around the mean estimate. A univariate sensitivity analysis was performed on the cost of treatment, by including 25% wastage for the treatment drugs.

Results
Compared with timolol, the incremental cost-effectiveness ratio of latanoprost was $34.48 and that of travoprost was $39.06, per extra millimetre reduction in IOP. Compared with brimonidine, the ratio of latanoprost was $16.17. Compared with dorzolamide, latanoprost was more effective and less costly (dominant).

The results of the sensitivity analysis showed that latanoprost remained a dominant strategy relative to dorzolamide, and the positive incremental cost-effectiveness ratios remained for all other comparisons.

Authors’ conclusions
The authors concluded that latanoprost was more cost-effective than dorzolamide or brimonidine for the treatment of glaucoma and elevated IOP. Neither latanoprost nor travoprost was cost-effective compared with timolol for first-line treatment, but they might be for second-line treatment.

CRD commentary
Interventions:
The authors compared the newest class of glaucoma medications with other glaucoma medications in current practice. They based their choice of interventions on those included in a systematic review, but they did not explain the justification for this choice in the review.

Effectiveness/benefits:
The authors attempted to use the best available clinical evidence through a systematic literature search. The relevant details of the selected study were reported, but the methods of literature review and sources searched were not reported. You should consider if the measure of benefit (IOP at three months) adequately captured the health benefits of the treatments.

Costs:
The perspective was stated and the cost estimates appear to have been relevant to the setting and population. References for the sources of the cost data were provided. No price year was reported and no information was given about adjusting the costs to a common price year.

Analysis and results:
The use of an incremental analysis was appropriate to determine the cost-effectiveness of the interventions. The impact of uncertainty was appropriately addressed with both univariate and probabilistic sensitivity analyses. The authors highlighted the limitations of their results and where they could be generalised.

Concluding remarks:
There was uncertainty as to whether the best available clinical evidence was used and whether the cost analysis was appropriately conducted. The authors’ conclusions should be considered with caution.

Funding
Not stated.

Bibliographic details

PubMedID
Goldberg LD, Walt, J. Cost considerations in the medical management of glaucoma in the US: estimated yearly costs and cost effectiveness of bimatoprost compared with other medications. Pharmaco economics 2006;24:251-64.