Statin's cost-effectiveness: a Canadian analysis of commonly prescribed generic and brand name statins

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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
This study compared the cost-effectiveness of the four most commonly used brand and generic statins in Canada, for the management of dyslipidaemia. The authors concluded that brand statins were a cost-effective option in Canada. The study was clearly reported and the analysis appears to have been appropriate. The conclusions reached by the authors appear to reflect this analysis.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
This study compared the cost-effectiveness of the most commonly prescribed statins in Canada for adult patients with hypercholesterolaemia, which is a high low-density lipoprotein cholesterol (LDL-C) level.

Interventions
The four treatments compared were brand-name rosuvastatin at fixed daily doses of 10, 20, or 40mg, brand-name atorvastatin (10, 20, 40, or 80mg), generic pravastatin (10, 20, or 40mg), and generic simvastatin (10, 20, 40, or 80mg).

Location/setting
Canada/primary care.

Methods
Analytical approach:
A published peer-reviewed model was used to assess the cost-effectiveness of the treatment options. The time horizon of the analysis was one year and authors reported that the perspective was that of the third party payer, the Canadian health care system.

Effectiveness data:
The effectiveness data were obtained from a published study, the STELLAR trial (Jones, et al. 2003, see 'Other Publications of Related Interest' for bibliographic details). The trial was a multicenter, parallel-group, open-label randomised trial which included 2,431 patients. The main clinical parameters included the decrease in LDL-C level, and LDL-C goal attainment within four to six weeks of treatment.

Monetary benefit and utility valuations:
None.

Measure of benefit:
The measures of benefit were percentage decrease in LDL-C level and number of patients achieving LDL-C goals as indicated by the National Cholesterol Education Program Adult Treatment Panel III (NCEP ATP III) guidelines.

Cost data:
Only the medication costs were included. These costs were obtained from official sources and were reported in Canadian dollars (CAD) for the price year of 2006. Discounting was not relevant.

Analysis of uncertainty:
A threshold analysis was conducted in order to determine the cost at which the treatments would achieve a net monetary benefit equivalent to the most cost-effective option in the base-case analysis. These results were presented graphically across a range of willingness-to-pay values.

**Results**
The results were presented for cost per one percent decrease in LDL-C, cost per patient achieving the target LDL-C level, and using a net monetary benefit analysis. The net monetary benefit results were presented in the form of cost-effectiveness acceptability curves (CEACs) of the probability of a statin being cost-effective across a range of willingness-to-pay values.

The three most cost-effective treatment regimes, for mean cost per one percent decrease in LDL-C, were rosuvastatin 10mg (CAD 10.81), rosuvastatin 20mg (CAD 11.86) and generic simvastatin 80mg (CAD 12.28).

The three most cost-effective treatment regimes, for mean cost per patient achieving target LDL-C, were rosuvastatin 10mg (CAD 604.51), rosuvastatin 20mg (CAD 699.72) and generic simvastatin 80mg (CAD 683.62).

The CEACs showed that rosuvastatin 10mg was the most cost-effective, for both outcomes, over a wide range of willingness-to-pay values (CAD 5.50 to CAD 19 for a one percent LDL-C decrease and CAD 300 to CAD 1,725 for a patient reaching their goal). However, when the value of a one percent decrease in LDL-C was less than CAD 5.50 and the value of a patient reaching their LDL-C goal was less than CAD 300, generic pravastatin was the more cost-effective option. Also, when the value of a one percent decrease in LDL-C was more than CAD 19 and the value of a patient reaching their LDL-C goal was more than CAD 1,725, rosuvastatin 20mg was the more cost-effective option.

The threshold analysis showed that all medication costs needed to drop to achieve the same net monetary benefit as that of 10mg of rosuvastatin, particularly at higher willingness-to-pay values.

**Authors’ conclusions**
The authors concluded that generic statins were not necessarily the most cost-effective option for treating dyslipidaemia in Canada.

**CRD commentary**
**Interventions:**
The interventions were clearly reported including their doses. However, they only included the interventions which were most commonly used in the authors' setting. It is therefore unclear if all the comparators relevant to a UK setting were analysed.

**Effectiveness/benefits:**
The effectiveness data were derived from a single published trial, the selection of which was not explicitly justified. Full details of the trial were not reported in this paper, meaning that a full assessment of its internal validity was not possible. However, the main details were given and the authors stated that it was the most comprehensive trial available that compared widely prescribed statins. Uncertainty in the sample estimates was addressed through the use of bootstrapping (1,000 samples), which also produced the distribution of the sample.

**Costs:**
It was assumed that costs relating to serious adverse events, physician and nurse visits and laboratory costs would be the same across all comparators and were therefore excluded, leaving only medication costs. Whilst this costing may appear limited, it is likely that all relevant costs were included.

**Analysis and results:**
The details of the analysis were fully reported. The authors presented results in both cost per unit change in clinical efficacy and a net monetary benefit analysis, which is an appropriate alternative to an incremental cost-effectiveness analysis. The impact of uncertainty was addressed through the use of bootstrapped simulations and some explanation of the results was provided. Overall, the level of reporting was good and the authors appropriately outlined the main limitations to their study.
Concluding remarks:
The study was clearly reported and the analysis appears to have been appropriate. The conclusions reached by the authors appear to reflect this analysis.

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