Cost-effectiveness of high-dose atorvastatin compared with regular dose simvastatin


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 evaluated the long-term cost-effectiveness of two options for the secondary prevention of cardiovascular disease in patients, under 80 years old, who had experienced acute myocardial infarction. At a willingness-to-pay of 50,000 Euros per quality-adjusted life-year, atorvastatin was cost-effective compared with simvastatin in Denmark, Norway and Sweden, while in Finland it was cost-effective only for high-risk patients. Despite some limitations to the clinical data, the analysis was reasonably transparent and the results appear to reflect the available evidence.

Type of economic evaluation
Cost-effectiveness analysis, cost-utility analysis

Study objective
This study evaluated the long-term cost-effectiveness of two treatment options for the secondary prevention of cardiovascular disease in patients who had experienced Acute Myocardial Infarction (AMI) and who were younger than 80 years.

Interventions
A high dosage of atorvastatin (80mg per day) was compared with simvastatin (20 to 40mg per day).

Location/setting
Denmark, Finland, Norway and Sweden/primary and secondary care.

Methods
Analytical approach:
The long-term cost-effectiveness of both strategies was assessed using a Markov model, in which patients were treated for five years and were followed up to a maximum age of 100 years. The long-term survival was calculated by estimating the risk of death using Weibull regressions. The authors did not state a study perspective.

Effectiveness data:
The effectiveness data were obtained from the Incremental Decrease in Endpoints Through Aggressive Lipid Lowering (IDEAL) trial. This was a prospective, randomised, open-labelled, blinded trial of 8,888 patients under 80 years old who had experienced an AMI. These patients were followed for an average of 4.8 years.

Monetary benefit and utility valuations:
The utility weights were obtained from published literature, where the data were evaluated using the EuroQol-5D questionnaire.

Measure of benefit:
The measures of benefit were life-years gained and quality-adjusted life-years (QALYs). Future health benefits were discounted at an annual rate of 3%.

Cost data:
The cost categories were the cost of medication, hospitalisation, the costs for various events and procedures, and productivity losses due to absence from work. The costs were based on resource consumptions recorded in the trial multiplied by the recent unit costs from each country and these were reported in Euros (EUR). The price year was 2005. Future costs were discounted at annual rate of 3%.
Analysis of uncertainty:
Parameter uncertainty was investigated through probabilistic sensitivity analysis using second order Monte Carlo simulations. The distributions were extrapolated using non-parametric bootstrapping. These results were reported in the form of cost-effectiveness acceptability curves based on the net-benefit data.

Results
The high-dose treatment was predicted to lead to a mean increase in survival of 0.049 years per patient and 0.033 QALYs gained.

The incremental cost per additional QALY was predicted to be EUR 47,197 for Denmark, EUR 62,639 for Finland, EUR 35,210 for Norway, and EUR 43,667 for Sweden.

These results were sensitive to variations in risk, discount rate and treatment duration.

Authors’ conclusions
The authors concluded that, at a willingness to pay of EUR 50,000 per QALY, atorvastatin was a cost-effective option when compared with simvastatin in Denmark, Norway and Sweden, while for Finland it was cost-effective only for high-risk patients.

CRD commentary
Interventions:
The interventions were clearly reported included the dosage. However, it was not clear whether there were other relevant interventions which could have been considered.

Effectiveness/benefits:
The effectiveness data were derived from a prospective randomised controlled trial. However, the methods used to identify the primary studies and the inclusion criteria were not reported. Therefore, it is difficult to ascertain whether the best available evidence was used. The full details of the trial were not reported in this paper, and so a full assessment of its internal validity was not possible. The methods used to derive the survival estimates and the risk of AMI and revascularisation were clearly presented.

Costs:
The perspective of the study was not explicitly reported but it appears that the costs reflected the societal perspective. The authors provided a detailed description of the method used to derive the cost information, the sources used, and the assumptions made. The cost data appeared to be appropriate for the study population and settings.

Analysis and results:
The model structure was clearly reported along with all relevant details and the modelling assumptions. The authors conducted an incremental analysis and the results were adequately presented. Sensitivity analyses were conducted on the modelling assumptions and parameters, enhancing the generalisability of the study findings. The authors compared their findings with those from other studies which, in general, were in agreement

Concluding remarks:
Despite some limitations to the clinical data, the authors presented a reasonably transparent analysis and it is likely that the results reflected the available evidence.

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Bibliographic details