Cost-effectiveness of managing familial hypercholesterolemia using atorvastatin-based preventive therapy

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 investigated the cost-effectiveness of various preventive lifetime lipid-lowering interventions for patients with a genetic diagnosis of familial hypercholesterolaemia. The authors concluded that atorvastatin 80mg monotherapy was cost-effective and the addition of ezetimibe led to additional benefits at a reasonable additional cost, from the perspective of the Spanish health care system. The study was generally well conducted and presented, especially in economic terms, but a more comprehensive analysis of uncertainty is needed to corroborate the authors’ conclusions.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
This study investigated the cost-effectiveness of various preventive, lifetime, lipid-lowering interventions for patients with a genetic diagnosis of familial hypercholesterolaemia (FH).

Interventions
The preventive strategies were atorvastatin monotherapy at either 40mg or 80mg, alone or combined with ezetimibe 10mg. These four strategies were compared with the current clinical practice (usual care) and with no intervention. Usual care consisted of lipid-lowering therapies (statins) at doses actually used in the authors’ Spanish setting.

Location/setting
Spain/primary care.

Methods
Analytical approach:
This economic evaluation was based on a longitudinal population model with a lifetime horizon. The authors stated that the analysis was carried out from the perspective of the Spanish health care system.

Effectiveness data:
The clinical data came from selected sources known to the authors. The patients’ characteristics were taken from the Spanish FH Registry of 881 patients. The mortality data were taken from Spanish life tables. The disease progression and increased mortality due to FH were derived from the Framingham Heart Study and other published studies. Few details of these sources were given. The key clinical endpoint was the treatment efficacy.

Monetary benefit and utility valuations:
Not relevant.

Measure of benefit:
Life-years (LYs) were the summary benefit measure and were discounted at 3% per annum.

Cost data:
The economic analysis included lipid-lowering therapy and management of FH, which included hospital assistance, diagnostic tests, physician visits, and treatment of cardiovascular events, including ischaemic cardiomyopathy, myocardial infarction, congestive heart failure, and ictus (stroke). The resource use data reflected Spanish patterns,
especially for the frequency of cardiovascular complications, and were based on published registries, diagnosis-related groups, and experts’ opinions. The unit costs came from official Spanish sources. All costs were in Euros (EUR), for the price year 2005, and future costs were discounted at an annual rate of 6%.

Analysis of uncertainty:
A deterministic sensitivity analysis was undertaken in which the best- and worst-case scenarios were considered for the standardised mortality ratio (SMR). In an alternative scenario, a 6% annual discount rate was applied to both costs and benefits.

Results
In the base case, the expected costs over no treatment were EUR 28,710 with usual care; EUR 30,569 with atorvastatin 40mg; EUR 36,104 with atorvastatin 40mg plus ezetimibe; EUR 30,133 with atorvastatin 80mg; and EUR 35,317 with atorvastatin 80mg plus ezetimibe. The LYs gained were 1.97 with usual care; 2.59 with atorvastatin 40mg; 3.38 with atorvastatin 40mg plus ezetimibe; 2.75 with atorvastatin 80mg; and 3.62 with atorvastatin 80mg plus ezetimibe.

Compared with usual care, the incremental cost per LY gained was EUR 3,012 with atorvastatin 40mg; EUR 5,250 with atorvastatin 40mg plus ezetimibe; EUR 1,821 with atorvastatin 80mg; and EUR 4,021 with atorvastatin 80mg plus ezetimibe.

The sensitivity analysis showed that the change in the SMR affected the cost-effectiveness ratios, but did not substantially alter the findings.

Authors’ conclusions
The authors concluded that atorvastatin 80mg monotherapy was cost-effective, from the perspective of the Spanish health care system, and the addition of ezetimibe led to additional benefits at a reasonable incremental cost.

CRD commentary
Interventions:
The selection of the comparators appears to have been appropriate for reflecting the available preventive strategies in the authors’ setting. Usual care reflected the clinical doses of lipid-lowering therapies as found in the national Spanish registry.

Effectiveness/benefits:
The authors used a selective approach to identify the relevant sources of data. Generally, the use of national databases is a valid strategy, given their ability to be representative, but they provide administrative data, which may not be appropriate for every analytic model. Other sources of data (e.g. the Framingham equations) are often used to model the disease progression for cardiovascular disease, and so they were valid sources. The other studies used for the clinical data were not described, which makes it difficult to objectively assess whether these sources were appropriate. LYs are a valid summary benefit measure given the impact of the disease on survival. They also permit cross-disease comparisons to be made.

Costs:
The categories of costs and their sources reflected the perspective stated. Only the direct medical costs relating to therapy and further treatment were considered. The unit costs and resource quantities were presented separately and reported in detail. In general, the calculation of total costs was transparently reported. The price year and the use of discounting were also reported. The cost estimates were treated deterministically and no sensitivity analysis was performed on them. The authors stated that adverse events associated with treatment were not included as they would have had an equivalent effect on all arms of the model.

Analysis and results:
The costs and benefits were appropriately synthesised using an incremental analysis and were clearly presented. An incremental analysis between the intervention strategies would have been interesting rather than an analysis with respect to usual care only. The issue of uncertainty was only partially addressed in the sensitivity analysis, which focused on a single, key model input. A comprehensive assessment would have been more appropriate. The authors acknowledged
some limitations of their analysis such as the need for assumptions to extrapolate the short term clinical data to the long
term and the need for experts’ opinion for some resource use data.

Concluding remarks:
The study was generally well conducted and presented, especially in economic terms, but a more comprehensive
analysis of uncertainty could corroborate the authors’ conclusions.

Funding
Not stated.

Bibliographic details
382-393

PubMedID
18405519

Original Paper URL
http://www.revespcardiol.org/cardio_eng/ctl servlet?_f=60& amp;ident=13119519

Other publications of related interest
Marang-van de Meen PJ, Ten Asbroek AH, Bonneux L, Bonsel GJ, Klazinga NS. Cost-effectiveness of a family and
DNA based screening programme on familial hypercholesterolaemia in The Netherlands. European Heart Journal 2002;
23: 1922-1930.


Smilde T, van Wissen S, Wollersheim H, Trip M, Kastelein J, Stalenhoef A. Effect of aggressive versus conventional
lipid lowering on atherosclerosis progression in familial hypercholesterolaemia (ASAP); a prospective, randomised,


Indexing Status
Subject indexing assigned by NLM

MeSH
Adolescent; Adult; Aged; Aged, 80 and over; Anticholesteremic Agents /administration & dosage /economics;
Atorvastatin Calcium; Azetidines /administration & dosage /economics; Cost-Benefit Analysis; Drug Therapy,
Combination; Ezetimibe; Female; Haptanoic Acids /administration & dosage /economics; Humans;
Hyperlipoproteinemia Type II /drug therapy /prevention & control; Longitudinal Studies; Male; Middle Aged; Models,
Economic; Pyrroles /administration & dosage /economics

AccessionNumber
22008101209

Date bibliographic record published
31/03/2009

Date abstract record published