Cost-effectiveness of HMG-CoA reductase inhibition for primary and secondary prevention of coronary heart disease

Goldman L, Weinstein M C, Goldman P A, Williams L W

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.

Health technology
HMG-CoA (3-hydroxy-3-methylglutaryl coenzyme A) reductase inhibitors (such as lovastatin) for the primary and secondary prevention of Coronary Heart Disease (CHD).

Type of intervention
Primary and secondary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
The study consisted of a sample of: a) males and females between the ages of 35 and 64 years, initial cholesterol level of 6.47 mmol

Setting
The study was carried out in the USA.

Dates to which data relate
The price date was 1989.

Source of effectiveness data
Review of studies.

Modelling
Epidemiological cohort model (model of survival and disease).

Measure of benefits used in the economic analysis
Life years gained.

Direct costs
Costs were discounted at 5%. Direct costs were to the health service and included: physician visit, cholesterol and liver enzyme tests, ophthalmologic examination;drug. These costs related to the cases of cardiac arrest, myocardial infarction, angina, CABG, catheterization and continuing care. Price related to 1989.
Currency
US dollars ($). In the DH Register of Cost-Effectiveness Studies, the original results were converted to UK pounds sterling (£) using GDP purchasing power parities and reflated to 1991 using the NHS pay and prices index.

Sensitivity analysis
One-way simple sensitivity analysis (single parameter variation).

Cost results
Treatment with lovastatin required on average: one extra physician visit, two additional liver and enzyme tests and one extra ophthalmologic examination (for an estimated 83% of patients) per year. Cost duration was life long.

Synthesis of costs and benefits
Outcome duration was life long. Costs and benefits were discounted at 5%. For men with coronary heart disease aged 35-44, initial cholesterol level greater than 6.47 mmol/L, the incremental costs of the intervention were negative, and the incremental benefits were positive. For men aged 45-54, initial level equal or greater than 6.47 mmol/L, history of CHD the incremental cost per life year gained was 1110. For women with coronary heart disease aged 35-44, initial level greater than 6.47 mmol/L, history of CHD the incremental cost per life year ranged from 2420-5610 with the minimum reached at the intermediate age band of 45-64 years, and the maximum reached for the age band 55-64 years. For asymptomatic men with a different combination of risk factors the incremental costs per life year decreased with age and a combination of risk factors ranging from a maximum of 478000 for men aged 35-44, initial level 6.47-7.73 mmol/L, no risk markers, to a minimum of 9000 for men aged 45-54, initial levels equal or greater than 7.76 mmol/L, smokers, weight > 130% of ideal, high blood pressure equal or greater than 105 mmHg. For asymptomatic women, the incremental costs per life year gained decreased with age and risk factors, with increases ranging from 1.04 million for women aged 35-44, no risk markers, to 38800 for women aged 55-64, blood pressure equal or greater than 105 mm Hg. For women with coronary heart disease, initial level equal or greater than 7.76 mmol/L, smokers, weight > 130% ideal, high blood pressure, the incremental cost per life year gained ranged from 135000 (aged 35-44 years) to 23500 (aged 55-64 years).

CRD Commentary
(This commentary was not written by CRD, but by the authors of the DH Register.) 1) Quality of life effects are not addressed, e.g. side effects of therapy, labelling and non-fatal CHD events. 2) Increased mortality from other causes is not modelled, for those on drug therapy. 3) Benefits from serum cholesterol reduction are estimated from observational rather than intervention data. 4) The parameters investigated by sensitivity analysis and the ranges of values were not adequately justified.

Bibliographic details

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1899896

Indexing Status
Subject indexing assigned by NLM

MeSH
Adult; Aged; Aged, 80 and over; Cholesterol /blood; Coronary Disease /prevention & control; Cost-Benefit Analysis; Female; Humans; Hypercholesterolemia /blood /drug therapy /economics; Lovastatin /therapeutic use; Male; Middle Aged; Primary Prevention; Sensitivity and Specificity