The cost-effectiveness of the switch towards more expensive antihypertensive drugs

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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.

Health technology
New antihypertensive drugs, specifically: ACE-inhibitors and calcium-antagonists.

Type of intervention
Primary prevention

Economic study type
Cost-effectiveness analysis

Study population
Hypertensive patients.

Setting
Primary care. Economic study carried out in Sweden.

Dates to which data relate
1990-1993 studies were used to estimate effectiveness data. Dates for costs varied, for example, 1978 for stroke costs were used. All costs were converted to 1992 price levels.

Source of effectiveness data
A published review

Modelling
Computer simulation model was used to estimate costs and benefits.

Outcomes assessed in the review
Reduction in CHD and stroke.

Study designs and other criteria for inclusion in the review
The most recent meta-analysis for diuretics and beta-blockers was used

Sources searched to identify primary studies
Not stated.
Criteria used to ensure the validity of primary studies
Not stated.

Methods used to judge relevance and validity, and for extracting data
Not stated.

Number of primary studies included
One meta-analysis.

Methods of combining primary studies
Not stated.

Investigation of differences between primary studies
Not stated.

Results of the review
The meta-analysis showed a 16% reduction in CHD and 38% reduction in stroke for diuretics and beta-blockers. Epidemiologically a 20-25% reduction in CHD would be expected using ACE-inhibitors and calcium antagonists. Therefore, the author used a 23% reduction in CHD and a 38% reduction in stroke for its main analysis. However, for an analysis of the new drugs for patients intolerant to the older drugs a 16% and 38% reductions were assumed for CHD and stroke respectively.

Measure of benefits used in the economic analysis
Life-years gained, estimated using a simulation model.

Direct costs
Costs and quantities were not reported separately. Health service and patients costs were included (physician consultation, drug and travel). Costs of therapy were taken from unpublished survey, costs of treatment of stroke and myocardial infarction were derived from published estimates as were averted costs. Costs were discounted at 5%. 1992 prices were used. Final costs were derived using a simulation model.

Indirect Costs
Costs and quantities were not reported separately. The value of production losses was derived from published sources and were discounted at 5%. 1992 prices were used. Final costs were derived using a simulation model.

Currency
Swedish Kroner.

Sensitivity analysis
One way simple sensitivity analysis was carried out by varying: CHD risk reduction; mortality risk after events; pretreatment risk of CHD and stroke; strength of association of risk with pretreatment cholesterol values; prevalence of risk factors; disease costs; costs of drugs; discount rate. Finally, QALYs were included in the sensitivity analysis.

Estimated benefits used in the economic analysis
Cost results
Total and incremental costs were not reported separately, but combined in the synthesis.

Synthesis of costs and benefits
The cost per life-year gained of treatment with diuretics and beta-blockers varied between SEK 3000 and SEK 1,805,000 in the different patient groups, and the treatment was also cost saving in several patient groups. The incremental cost-effectiveness ratio of ACE inhibitors and calcium antagonists compared with diuretics and beta-blockers varied between SEK 54,000 and SEK 6,238,000 in the different patient groups.

The cost-effectiveness ratio of ACE-inhibitors and calcium antagonist compared with no treatment varied between SEK 4,000 and SEK 3,310,000 in the different patient groups, with cost saving occurring for some groups.

The cost-effectiveness ratio was sensitive towards the variation in the risk reduction, the pre-treatment risk and the discounting, and was more stable among older people.

Authors' conclusions
It is appropriate to use diuretics and beta-blockers as first line therapy. ACE-inhibitors and calcium antagonists should only be used for patients who cannot tolerate these drugs. However, if ACE-inhibitors and calcium antagonists are shown in randomised trials to achieve the epidemiologically expected reductions in CHD then they may be the preferred first treatment for some patient groups.

CRD Commentary
This was an extensive cost-effectiveness study which addressed the 'what if' question of newer hypertensive drugs. The study showed that for a few patients who cannot take the older drugs the newer drugs may induce resource savings. However, the authors' final comments are at variance with the study findings. Assuming that clinical trials do show that the new drugs achieve a 23% reduction in CHD rather than 16%, then the older drugs will still be more cost-effective and should therefore be the first line therapy.

Implications of the study
The study is well conducted and the authors' conclusion seem appropriate for use by decision makers. However, a randomised controlled trial would be useful for a full evaluation.

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