Cost-effectiveness study of nitrate therapy using a decision analysis methodology

Larrat E P

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
Three drugs were considered for angina cases: isosorbide dinitrate (ISDN); isosorbide mononitrate (ISMO) and nitroglycerin patches.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Hypothetical 45-55 year old male patients newly diagnosed with acute episode of angina, with intermittent chest pain that correlated with exercise and who were not immediate candidates for coronary artery bypass surgery.

Setting
Hospital. Both the effectiveness and cost data related to the USA.

Dates to which data relate
It is unclear to which dates the effectiveness data related, but the cost data related to January 1992.

Source of effectiveness data
Review of the literature and clinical experts' opinions.

Modelling
Management decision tree was used to calculate final costs.

Outcomes assessed in the review
The probabilities to be included in the decision model, such as titration, tolerance and remission probabilities.

Study designs and other criteria for inclusion in the review
Not specified.

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
Not stated.

Methods of combining primary studies
The probability data was averaged to determine the final probability.

Investigation of differences between primary studies
Not stated.

Results of the review
The ISDN, patch and ISMO probabilities differed only in the probability of tolerance by patients and the need for dose titration. The probability of patient tolerance (i.e. decreased duration of drug activity and dose response) was 0.0850 for ISMO, 0.6305 for ISDN and 0.3540 for patch. The probability of the need for dose titration was 0.2750 for ISMO, 0.6710 for ISDN and 0.6710 for patch. ISMO was therefore associated with a more favourable patient tolerance and a less frequent need for dose titration.

Methods used to derive estimates of effectiveness
A questionnaire was used to collect data on event probability and was sent to eight nationally known cardiologists experienced in the use of all three drugs. Clinical judgement was used for those values that could not be obtained directly from the medical literature.

Estimates of effectiveness and key assumptions
These were not reported separately from the results of the review.

Measure of benefits used in the economic analysis
Probability of treatment success, where success was strictly defined as total control of angina symptoms.

Direct costs
A third party payer perspective was used.

Physician experts estimated the quantity of medical services needed, including length of inpatient stays. Direct costs were calculated separately and included cost of the drugs (estimated using average wholesale price but excluding the lowest and highest estimates for ISDN, and one pharmaceutical company for ISMO, and from a HMO survey of acquisition costs for the patches), costs of treatment failure (extra drugs and physician visits) and surgery costs (based on Health Care Financing Administration and third party rates). Direct medical care costs were annualised but no discount was reported. 1992 prices were used. Final costs were calculated using a decision tree.

Currency

NHS Economic Evaluation Database (NHS EED)
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US dollars ($)

Sensitivity analysis
This was performed on probability estimates and estimated costs. However, the specific form of the sensitivity analysis is poorly specified.

Estimated benefits used in the economic analysis
The estimated benefits are not specified in isolation, but only as part of the synthesis of costs and benefits.

Cost results
The annualised costs of ISMO were $5,193.06, $7,207.25 for ISDN and $6,152.31 for the patch.

Synthesis of costs and benefits
The cost-effectiveness ratios were $15,594 for ISMO, $21,386 for ISDN and $18,988 for nitroglycerin patches.

Authors' conclusions
Despite the higher cost of ISMO, the cost-effectiveness ratio is lower for ISMO than for the other two drugs (ISDN and nitroglycerin patches).

CRD Commentary
Although relatively clearly set out, the paper still remains unclear on the type and extent of the sensitivity analysis performed and fails to clearly report the final benefit figures used in the cost-effectiveness analysis. Incremental cost analysis is not necessary since the clinical review showed the intermediate benefits to be higher.

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Data analysis assistance was received from Kay-Rem Associates

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