Cost-effectiveness of cardiac rehabilitation after myocardial infarction
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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
Cardiac rehabilitation after myocardial infarction (MI).

Type of intervention
Rehabilitation.

Economic study type
Cost-effectiveness analysis.

Study population
A post-MI population.

Setting
Hospital. The economic study was carried out in the USA.

Dates to which data relate
The effectiveness analysis data were collected from the medical literature published between 1981 and 1995. The resource use data were extracted from the literature and refer to the period 1985-1986. The price year used was 1995.

Source of effectiveness data
Effectiveness data were derived from a review of previously completed studies.

Link between effectiveness and cost data
The costing was not undertaken on the same patient sample as that used in the effectiveness study. The costing was undertaken retrospectively.

Outcomes assessed in the review
The review assessed the rates of all-cause mortality/survival in the first 3 post-MI years.

Study designs and other criteria for inclusion in the review
Randomized trials of cardiac rehabilitation on mortality rates, epidemiologic studies of long-term survival in the overall postinfarction population were retrieved. The inclusion criteria considered males with a post acute MI below the age of 65 years.
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
11 studies were included in the review.

Methods of combining primary studies
The survival results of the individual primary studies were combined using meta-analysis.

Investigation of differences between primary studies
Differences were investigated in terms of the number of participants.

Results of the review
Cumulative all-cause mortality in the rehabilitation group was found to be reduced by 21.2% at the end of 1, by 22.9% at the end of 2 years and 16.9% at the end of 3 years of follow-up.

Methods used to derive estimates of effectiveness
The estimates of effectiveness were based on authors' assumptions.

Estimates of effectiveness and key assumptions
The estimates of effectiveness were rates of all-cause mortality/survival in the first 3 post-MI years. The assumptions for effectiveness estimates were that cardiac rehabilitation affects all-cause mortality only in the three-year period subsequent to the index event and that the mortality rate of the post-rehabilitation population is no different from that of the untreated coronary population after 3 days. To estimate survival curves the following assumptions were considered:

1. survival probabilities for the two groups were identical for all years,
2. the average life expectancy of the control group was equal to that of the intervention group,
3. cumulative survival at the mean life expectancy was equal to 0.50,
4. for the control group, an exponentially diminishing annual survival rate (prediction 15.4 year of life expectancy),
and
5. survival probabilities were equal for both the control and rehabilitation groups.

Measure of benefits used in the economic analysis
The benefit measure was years of life saved (YLS).
Direct costs
Costs were discounted at 5%. Quantities and costs were reported separately. Costs refer to charges or payments made, or averted, for direct medical services which include hospitalizations, physician services, other nonphysician services, drugs and diagnostic tests. The estimation of the quantities and costs was based on published information from other studies. Price data refer to 1995.

Currency
US dollars ($). Inflation for the year 1995 was estimated at 4.0%. The compound rate of inflation was 120% of the consumer item for the decade 1985 to 1994. The prices were updated to the year 1995.

Sensitivity analysis
A sensitivity analysis was carried out varying the survival rate, the survival probabilities and the rehospitalisation expenses averted. The benefits and cost assumptions were the areas of uncertainty subjected to analysis.

Estimated benefits used in the economic analysis
The rates for mortality and increased survival were 126.1 and 0.202 in 1985 and 88.9 and 0.190 in 1995.

Cost results
Costs were discounted at 5%. The net cost for MI was $430 in 1985 and $940 in 1995. The costs of other common interventions were not stated.

Synthesis of costs and benefits
The estimated benefits and costs were combined as cost per life years saved. The cost per year of life saved was $2,130 in 1985 and the cost per year of life saved (projected) was $4,950 in 1995 (at a 5% discount rate).

Authors' conclusions
Cardiac rehabilitation is highly cost-effective and compares favourably with other well accepted-medical therapies.

CRD COMMENTARY - Selection of comparators
A justification was given for the comparators used: thrombolytic therapy, coronary bypass surgery, and cholesterol lowering drugs and a smoking cessation programme. The comparators chosen were all commonly used regimens for cardiac rehabilitation.

Validity of estimate of measure of benefit
The authors based their analysis of effectiveness on studies with a randomised design, but it is not clear whether these were identified through a systematic search of the medical literature. It should be noted that estimated benefits are unlikely to be generalisable to females of the same age.

Validity of estimate of costs
The estimate of costs was based on published data and a number of assumptions. Sensitivity analyses were carried out to account for the uncertainties in the data. Charges were used rather than actual costs.

Other issues
As acknowledged by the authors, adjustment for quality of life could have been made. Furthermore, it is very likely that the results of a cost-utility analysis would confirm the findings of this study.
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