Long-term benefit of primary angioplasty as compared with thrombolytic therapy for acute myocardial infarction


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
Primary coronary angioplasty in the treatment of patients with acute myocardial infarction.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients with no contraindications to thrombolytic therapy and with symptoms of acute myocardial infarction, lasting longer than 30 minutes, accompanied by an electrocardiogram with ST-segment elevation of more than 1 mm (0.1 mV) in 2 or more contiguous leads, and presented within 6 hours after the onset of the symptoms, or within 6 to 24 hours after the onset of the symptoms if there was evidence of continuing ischemia.

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

Dates to which data relate
Effectiveness and resource use data were collected between August 1990 and September 1998. The fiscal year was 1992.

Source of effectiveness data
Effectiveness data were derived from a single study.

Link between effectiveness and cost data
Costing was retrospectively performed on the same patient sample as that used in the effectiveness analysis.

Study sample
Power calculations were not used to determine the sample size. The study sample consisted of 395 patients randomly allocated to the angioplasty group (n=194) with a mean (SD) age of 59 (11) years or to the streptokinase group (n=201) with a mean (SD) age of 60 (10) years.

Study design
Randomized controlled trial carried out in a single centre. The mean (SD) duration of follow up was 5 (2) years. 1 patient was lost to follow up.

Analysis of effectiveness
The principle used in the analysis of effectiveness was intention to treat. The primary outcome measures were death and the combined incidence of death and nonfatal reinfarction (defined as the combination of chest pain, changes in the ST-T segment, and a second increase in the serum creatinine kinase level to more than two times the upper limit of normal). The rate of readmission for heart failure and ischemia was also reported. The study groups were found comparable in terms of age, sex, infarct location, and the presence or absence of a previous myocardial infarction, multivessel coronary artery disease, and diabetes mellitus. Multivariate analyses were performed using the Cox proportional-hazard regression model. The Kaplan-Meier product-limit method was used to calculate survival.

Effectiveness results
The angioplasty group had a mortality rate of 13% versus 24% in the streptokinase group (relative risk, 0.54; 95% CI: 0.36 - 0.87).

The corresponding rates for nonfatal reinfarction were 6% in the angioplasty group and 22% in the streptokinase group (relative risk, 0.27; 95% CI: 0.15 - 0.52).

The angioplasty group had a lower rate of the combined incidence of death and nonfatal reinfarction compared to the streptokinase group with a relative risk of 0.13 (95% CI: 0.05 - 0.37) for early events (within the first 30 days) and a relative risk of 0.62 (95% CI: 0.43 - 0.91) for late events (after 30 days).

The angioplasty group also had a lower rate of readmission for heart failure and ischemia, (p<0.001).

Clinical conclusions
This study shows that primary angioplasty, as compared with intravenous streptokinase therapy, results in lower mortality and reinfarction rates both within the first 30 days and during long-term follow-up.

Measure of benefits used in the economic analysis
No summary benefit measure was identified in the economic study, and only separate clinical outcomes were reported.

Direct costs
Costs were not discounted although the mean (SD) follow-up was 5 (2) years. Some resource quantities were reported separately from the costs and the cost components were reported separately. The cost analysis covered the total medical charges per patient at the end of the follow-up period, which consisted of the charges for the initial hospital stay, readmission, procedures, physicians' charges, and medications. The perspective adopted in the cost analysis was not explicitly specified. Unit costs were estimated based on the 1992 hospital records. 1992 price data were used.

Statistical analysis of costs
A two-tailed Student's t test was used to compare the study groups in terms of costs.

Indirect Costs
Not considered.

Currency
US dollars ($).
Sensitivity analysis
Not conducted.

Estimated benefits used in the economic analysis
Not applicable.

Cost results
The angioplasty group had a total medical charge per patient of $16,090 versus $16,813 in the streptokinase group at the end of the follow-up period (p=0.05). The corresponding values for patients who were alive at the end of follow-up were $18,664 for the angioplasty group and $21,772 for the streptokinase group (p=0.008).

Synthesis of costs and benefits
Costs and benefits were not combined since the use of primary coronary angioplasty was the dominant strategy.

Authors' conclusions
Compared with thrombolytic therapy with streptokinase, primary coronary angioplasty is associated with better clinical outcomes over five years.

CRD COMMENTARY - Selection of comparators
No specific justification was given for the choice of the comparator. You, as a database user, should therefore consider whether this is a widely used health technology in your own setting.

Validity of estimate of measure of benefit
The internal validity of the effectiveness results is likely given the use of a randomized design. The study may be regarded as a cost-consequences analysis.

Validity of estimate of costs
Quantities of resource use were not fully reported separately from the costs. Insufficient details of methods of cost estimation were given. Charges were used as a proxy for true costs. Notwithstanding the fact that the costs were incurred over a period longer than 2 years, they do not appear to have been discounted.

Other issues
Appropriate comparisons were made with other studies. The issue of generalisability to other settings or countries was not addressed.

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