A comparison of the costs of and quality of life after coronary angioplasty or coronary surgery for multivessel coronary artery disease: results from the Emory Angioplasty versus Surgery Trial (EAST)

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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
Percutaneous transluminal coronary angioplasty (PTCA) for multivessel coronary artery disease.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients with multivessel coronary artery disease. The average age of patients was 62 years and 75% of patients were male.

Setting
The setting was Emory University Hospital. The economic study was conducted in Atlanta, USA.

Dates to which data relate
Effectiveness and resource data were collected between 1987 and 1990. Costs were deflated to 1987 US dollars ($) by using the Medical Consumer Price Index.

Source of effectiveness data
Single study.

Link between effectiveness and cost data
Costing was undertaken prospectively on the same patient sample as that used in the effectiveness study.

Study sample
198 patients were randomised to the PTCA group and 194 to the CABG group. No power calculations determined sample size.

Study design
Single-centre, randomised clinical trial. The duration of follow-up was 3 years. No loss to follow-up was clearly stated but 7% mortality rate during the follow-up period was reported in the PTCA group and 6% in the CABG group.
Analysis of effectiveness

The analysis of effectiveness was based on intention to treat. The main health outcomes used were mortality rates and the primary end point was defined as a composite of death, Q-wave myocardial infarction, and a large reversible thallium defect at 3 years. Quality of life measurements were also made but no single index was derived. The two study groups had similar patient characteristics.

Effectiveness results

At 3 years, there was no significant difference in mortality (7% vs. 6%) or primary end point results between the PTCA group and the CABG group. As to post-operative results, in-hospital deaths were infrequent at 1%. There was a trend towards more in-hospital Q-wave myocardial infarctions in the surgical group (3% vs. 10%). As regards quality of life, angina was more prevalent in the PTCA group, with a consequent increase in the need for antianginal medication. Almost two thirds of the patients reported good or very good health, with more patients reporting complete recovery in the CABG group (105 vs. 91 in the PTCA group). Conversely, there was a slight trend for more angioplasty patients to feel optimistic about their health compared to CABG patients. Most patients in each group reported the same or improved status 3 years after their procedure compared with before the procedure. Confidence intervals were not reported but p values were indicated.

Clinical conclusions

There were no differences between the two groups in 3 year mortality and primary end point results but there was a trend towards more in-hospital Q-wave myocardial infarctions in the surgical group.

Measure of benefits used in the economic analysis

Mortality rates and the primary end point defined as a composite of death, Q-wave myocardial infarction, and a large reversible thallium defect at 3 years. Quality of life measurements were also made but no single index was derived.

Direct costs

Some costs and resources were reported separately. Direct health service costs were considered such as hospital and professional charges. Charges were assessed from the hospital UB-82 bills and professional charges were assessed from the Emory clinic. Department specific costs were allocated by step down method. All costs and charges were deflated to 1987 US dollars ($).

Statistical analysis of costs

Costs data in the two groups were compared by the Mann-Whitney and the Kruskal-Wallis tests.

Currency

US dollars ($).

Sensitivity analysis

No sensitivity analysis was carried out.

Estimated benefits used in the economic analysis

At 3 years, there was no significant difference in mortality (7% vs 6%) or primary end point results between the PTCA group and the CABG group. As to post-operative results, in-hospital deaths were infrequent at 1%. There was a trend towards more in-hospital Q-wave myocardial infarctions in the surgical group (3% vs 10%). As regards the quality of life, angina was more prevalent in the PTCA group, with a consequent increase in the need for antianginal medication. Almost two thirds of the patients reported good or very good health, with more patients reporting complete recovery in
the CABG group (105 vs. 91 in the PTCA group). Conversely, there was a slight trend for more angioplasty patients to feel optimistic about their health compared to CABG patients. Most patients in each group reported the same or improved status 3 years after their procedure compared with before the procedure. Benefits were not discounted over the three year period.

Cost results
Mean initial hospital charges were $12,654 for the PTCA group and $20,214 for the surgery group (p <.0001). Professional charges were $4,538 for PTCA and $9,426 for surgery (p <.0001). Three-year hospital charges were $19,047 for PTCA and $21,174 for surgery (p <.0001). Three-year professional charges were $6,412 for PTCA and $9,861 for surgery (p <.0001). Three-year total charges were $25,458 for PTCA and $31,033 for surgery (p <.0001). Total three-year costs were $23,734 for PTCA and $25,310 for surgery (p <.0001). Costs were not discounted but were deflated to 1987 values.

Synthesis of costs and benefits
In the short term, PTCA was the dominant strategy. However, by the end of the third year, total costs and benefits were estimated to be similar.

Authors' conclusions
There was no difference in primary end point and its components at three years. Although the primary procedural costs of coronary surgery were higher than for coronary angioplasty, this cost advantage was largely, although probably not completely, lost by 3 years because of more frequent additional procedures and other resource consumption after a first revascularisation by PTCA.

CRD Commentary
A good study, with sound and clear design and interesting valuation of quality of life.

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MeSH
Angioplasty, Balloon, Coronary /economics; Chest Pain /epidemiology; Coronary Artery Bypass /economics; Coronary Disease /economics /epidemiology /therapy; Fees, Medical; Female; Follow-Up Studies; Heart Failure /epidemiology;