Cost-benefit of combined use of acupuncture, shiatsu and lifestyle adjustment for treatment of patients with severe angina pectoris

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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
Acupuncture, Shiatsu and lifestyle adjustment in patients with severe angina pectoris to reduce the incidence of death and myocardial infarction (MI).

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients with severe angina pectoris. The median age was 62. 61% of the patients who received acupuncture were male, whereas 73% who received CABG or PTCA were male. More detailed information on class, medication and patients’ history was reported in the paper.

Setting
The settings were an acupuncture centre and the secondary care sector. The economic study was conducted in Ega, Denmark.

Dates to which data relate
Effectiveness and resource data were collected for a median of 24 months. Patients were followed up until the occurrence of MI, death, invasive therapy or until November 1st 1995. The price dates were not stated explicitly, but it was mentioned that current prices were used.

Source of effectiveness data
Effectiveness data were derived from two studies.

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

Study sample
No power calculations were used to determine patient sample size. 69 patients with severe angina pectoris were treated with acupuncture, Shiatsu and lifestyle adjustments, and were followed for 2 years. 49 of these patients were candidates for CABG, whereas the remaining 20 patients were rejected for bypass grafting. The acupuncture group was compared to 392 patients who received invasive treatment (CABG or PTCA).
Study design
The study was a nonrandomized trial with historical controls in a single centre. The patients received 12 acupuncture treatments within a 4-week period according to traditional Chinese theory. No electrical or mechanical stimulation was given. Patients were also informed about adjustment of lifestyle and attitudes, stress coping techniques, daily relaxation exercise, daily physical exercise, and diets. Patients were followed for a median of 24 months (range: 2 - 108). The follow-up data were based on hospital reports, supplemented by reports from the general practitioner (GP) and questionnaires. As there was no regular control group, the results were compared with recently published results of CABG and PTCA.

Analysis of effectiveness
The analysis of the study was based on intention to treat. The main health outcomes assessed were death and/or MI, stroke with the initial hospitalisation, and death and/or MI during the observation period. Added to this, a visual analogue scale was used to evaluate the degree of disease and the quality of life. The groups were broadly comparable in age, sex, NYHA class, medication, heart failure, previous MI, previous CABG or PTCA, CABG or PTCA rejected and body-mass index.

Effectiveness results
Among the 69 patients receiving the combined use of acupuncture, Shiatsu and lifestyle therapy, 1 MI and 4 cardiac deaths occurred. This represents a 7% 24-month complication risk, compared to 21% and 15% for patients receiving CABG or PTCA, respectively. Amongst the patients receiving invasive treatment an additional risk for repeated invasive procedures of 9% and 52%, respectively was found. For the 49 acupuncture patients who were candidates for CABG, 30 patients (61%) postponed surgery due to improvement after treatment. Quality of life measurements elicited through a visual analogue scale showed that patients in the acupuncture group reported a marked improvement in quality of life. There was a median improvement from 37 to 101 mm in the analog scale (25% quartiles: 17-62 before treatment and 76-108 after treatment with p<0.001). There was also an improvement in the degree of disease with a median improvement from 90 to 27 mm (25% quartiles: 78-103 before treatment and 12-44 after treatment, p<0.001). The annual number of visits to the GP was reduced from 223 to 109 (49%) for the first year and to 83 visits (37%) for the second year. Visits to the cardiologist were reduced from 30 annual visits to 40% in the first year and 33% in the second year. In-hospital days were reduced from 438 days to 21% (first year) and 7% (second year). Hospital visits on an out-patient basis were reduced from 242 visits to 40% (first year) and 13% (second year). Compliance with therapy within the acupuncture group remained high 2 years after its initiation.

Clinical conclusions
The authors suggest that the combination of acupuncture, Shiatsu and lifestyle adjustments reduces the risk of dying and/or MI in patients with severe angina pectoris, relative to PTCA and CABG.

Modelling
None.

Measure of benefits used in the economic analysis
The main health outcomes were death and/or MI, stroke within the initial hospitalisation, and/or death over 2 years of follow up. Benefits were also reported for psychological aspects using the visual analogue scale to evaluate the degree of disease and quality of life and the Jenkins Activity Survey and Aaron Bech rating scale to evaluate the presence of mood disorders.

Direct costs
Costs were not discounted. Costs and quantities were reported separately. Medical expenses calculated included services of a GP ($20 per visit), cardiologist ($40 per visit), in-hospital days ($500 a day), out-patient visit ($250 per visit),
PTCA ($6,000), CABG ($15,000), and for pharmaceutical products (full retail price) during the 12 months prior to treatment and during the two 12 month periods after initiation of treatment. The cost of the acupuncture treatment was also included, as were cost savings due to estimated reductions in CABG and PTCA. The quantity/cost boundary adopted was the health and employment agency perspective. Estimation of quantities and costs were based on actual data. The date to which price data refer was not stated.

**Statistical analysis of costs**
Not conducted.

**Indirect Costs**
Estimates of sick payments were made.

**Currency**
US dollars ($).

**Sensitivity analysis**
Sensitivity analysis was not carried out.

**Estimated benefits used in the economic analysis**
The incidence of death and MI was 21% among patients undergoing CABG, 15% in the PTCA group and 7% in the acupuncture group. Pain relief in the 3 groups was not found to be statistically significantly different. Within the acupuncture group, 61% of the patients who were candidates for invasive treatment postponed this due to clinical improvement. Compared to the non-acupuncture group, the annual number of in-hospital days were reduced by 90% in the acupuncture group.

**Cost results**
Among the acupuncture patients the estimated saving was $225,000 in the first year and $275,000 for the second year due to reductions in the health services required. Added to this, the savings due to a reduction in surgery were estimated at $398,000. In contrast, 9% of the CABG and 52% of the PTCA were expected to be repeated within 24 months, with a cost of $50,000. Expenses for acupuncture were $115,000 for the first year and $15,000 for the second, a total of $130,000, and total savings of $820,000 or $12,000 for each patient. In addition, a hypothetical cost saving of $600,000, resulting from an estimated reduction the requirement for sick payments, was calculated.

**Synthesis of costs and benefits**
Costs and benefits were not synthesized directly. However as a reduction in death and MI was seen in the acupuncture group as well as a cost saving of $12,000 per patient, the acupuncture treatment appears to dominate in terms of cost-effectiveness compared to invasive treatments.

**Authors' conclusions**
The study suggests that combined treatment with acupuncture, Shiatsu and lifestyle adjustment may be highly cost effective for patients with advanced angina pectoris.

**CRD COMMENTARY - Selection of comparators**
The comparators used were CABG and PTCA from a large prospective, randomized trial. You should decide if these alternatives represent current practice within your own setting.
Validity of estimate of measure of benefit
The main health outcomes were a reduction in death and MI. The evaluation of these benefits seems to be appropriate. However, as the authors noted, no blinding techniques were used (nor were they feasible, given the differing nature of the interventions considered) so researcher and/or patient bias is possible. Also, patients' comparability across groups was not assured by statistical analyses and indeed the patient sample for the intervention was compared with that reported in a different (comparator) study. A longer period of follow up would have been beneficial.

Validity of estimate of costs
Costs were reported separately from prices and adequate detail was provided.

Other issues
The authors did not make any adjustments to control for the open design of the study and for possible bias within the study. However, as noted by the authors, achieving control would be problematic given the obvious differences that exist between the non-invasive intervention and invasive alternatives. Further randomised controlled trials, if ethical and feasible, are needed in order to confirm these findings.

Implications of the study
The authors acknowledge that further trials are needed to confirm the economic and clinical benefits suggested by these results.

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