Cost-effectiveness of acupuncture treatment in patients with headache
Witt C M, Reinhold T, Jena S, Brinkhaus B, Willich S N

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.

CRD summary
This study examined the cost-effectiveness of additional acupuncture treatment in patients with headache (migraine or tension-type headache for 12 months with at least two episodes per month) in comparison with routine care alone. The authors concluded that the use of acupuncture was a cost-effective strategy from the perspective of German society. The analysis was generally performed satisfactorily, with detailed reporting of the costs and clinical results. The authors’ conclusions appear valid and were enhanced by the extensive sensitivity analysis.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective was to examine the cost-effectiveness of additional acupuncture treatment in patients with headache (migraine or tension-type headache for 12 months with at least two episodes per month) in comparison with routine care alone. This study formed part of the Acupuncture in Routine Care (ARC) studies.

Interventions
The study compared routine care plus acupuncture (10 to 15 sessions) administered by physicians with routine medical care alone.

Location/setting
Germany/outpatient.

Methods
Analytical approach:
This economic evaluation was based on a single study. The time horizon was 3 months. The authors stated that a societal perspective was adopted in the study.

Effectiveness data:
A multi-centre, randomised, clinical trial (RCT) in adult patients with primary headache was performed. A sample of 3,182 patients (77.4% women) was enrolled, of which 1,613 were in the acupuncture group and 1,569 in the control group. With the exception of disease duration, which was longer in the control group, the baseline characteristics of the study groups were comparable. Baseline differences were taken into account in a statistical test aimed at minimising the potential impact of confounding.

Monetary benefit and utility valuations:
Utility valuations were elicited at baseline and after 3 months from the sample of patients enrolled in the RCT using the Short Form (SF)-36 questionnaire.

Measure of benefit:
The summary benefit measure was the quality-adjusted life-years. Discounting was not required given the short time horizon of the analysis.

Cost data:
The analysis of the costs included acupuncture, physician visits, hospital stay, drugs (including patients’ co-payments) and lost workdays. Resource use was derived from data obtained from patients in the RCT, while the unit costs were...
based on data from the social health insurance funds. The human capital approach was used to estimate the indirect costs. The costs were in euros (EUR). The price year was not reported. Discounting was not relevant and was not applied.

Analysis of uncertainty:
A bootstrapping approach was used to transform the cost-utility ratios into net benefit values for different threshold values and to generate cost-effectiveness acceptability curves. Deterministic sensitivity analyses explored a variety of acupuncture cost scenarios and alternative durations of therapeutic and economic effects. Moreover, in a specific scenario, the authors reduced the benefit difference between the two treatments over time. Simultaneous variations in clinical and economic data and the use of discounting for both costs and benefits were also considered. Finally, subgroup analyses were performed (women versus men).

Results
The total costs of treatment were EUR 857.47 (95% confidence interval, CI: 790.86 to 924.07) in the acupuncture group and EUR 527.34 (95% CI: 459.81 to 594.88) in the control group. The cost-difference (EUR 330.12) was mainly due to acupuncture costs.

The additional QALYs gained in the acupuncture group compared with the control group were 0.0301 (± 0.004), resulting in an incremental cost per QALY gained with acupuncture of EUR 11,657 (EUR 11,403 when adjusted for age and gender).

The sub-group analysis revealed that acupuncture was more cost-effective in men than in women with migraine, while it was more cost-effective in women than in men with tension-type headache. When using a common threshold for cost-effectiveness of EUR 50,000 per QALY, acupuncture treatment had almost 100% likelihood of being cost-effective.

The sensitivity analysis confirmed the robustness of the base-case findings and identified two key variables (the physician payment rate and decrease in effectiveness). However, there were no cases where the incremental cost per QALY of the acupuncture treatment resulted in a threshold higher than EUR 50,000.

Authors' conclusions
The authors concluded that the use of acupuncture for the treatment of headache was a cost-effective strategy in comparison with usual care from the perspective of German society.

CRD commentary
Interventions:
The selection of the comparators was appropriate since the strategy of acupuncture performed immediately was compared with a strategy of no acupuncture. However, details of the medications used in the routine care group were not provided.

Effectiveness/benefits:
The analysis of the clinical study was based on the results from a published RCT, which is usually considered to be a valid source of data on account of the strengths of its design (randomisation). Moreover, the large sample of patients enrolled enhances the internal validity of the analysis. The potential impact of confounding bias was limited by the use of appropriate statistical tests. As the study was published in a separate paper, some details were not reported. However, in general, the clinical analysis appears to have been conducted satisfactorily. The derivation of the utility valuations was appropriately based on a validated instrument and patient preferences.

Costs:
The authors reported a breakdown of the cost categories and some unit costs. The perspective of the analysis was broad in order to capture the costs relevant to all payers. The approach used to derive productivity losses was described. Resource consumption was taken from the sample of patients in the RCT and may not reflect real clinical practice. The price year was not provided and few details of the sources of the costs were given.

Analysis and results:
The synthesis of the costs and benefits was appropriately performed. One sensitivity analysis addressed the overall issue of uncertainty using the bootstrapping approach, while another sensitivity analysis specifically considered a few uncertain aspects of the study. Sub-group analyses were also conducted. The results of both the base-case and the sensitivity analyses were presented clearly.

**Concluding remarks:**
The analysis was generally performed satisfactorily, with detailed reporting of the costs and clinical results. The authors' conclusions appear valid.

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