Academy of PHYSICAL MEDICINE

Research Paper Review

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Cost-effectiveness of Acupuncture for Chronic Nonspecific Low Back Pain

Pain Practice 2013 Oct 21. doi: 10.1111/papr.12116. [Epub ahead of print]

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ABSTRACT

Cost-effectiveness is a major criterion underpinning decisions in mainstream health care. Acupuncture is increasingly used in patients with chronic lower back pain (LBP), but there is a lack of evidence on cost-effectiveness. The objective of this study was to assess the cost-effectiveness of acupuncture in alleviating chronic LBP either alone or in conjunction with standard care compared with patients receiving routine care, and/or sham. To determine effectiveness, we undertook meta-analyses which found a significant improvement in pain in those receiving acupuncture and standard care compared with those receiving standard care alone. For acupuncture and standard care vs. standard care and sham, a weak positive effect was found for weeks 12 to 16, but this was not significant. For acupuncture alone vs. standard care alone, a significant positive effect was found at week 8, but not at weeks 26 or 52. The main outcome parameters for our cost-effectiveness analysis were the incremental cost-effectiveness ratio (ICER) of acupuncture treatment presented as cost (A$) per disability-adjusted life-year (DALY) saved. The WHO benchmark for a very highly cost-effective intervention is one that costs less than gross domestic product per capita per quality-adjusted life-year (QALY) gained or DALY averted, or less than around $A52,000 in 2009 (the base year for the analysis). According to this threshold, acupuncture as a complement to standard care for relief of chronic LBP is highly cost-effective, costing around $48,562 per DALY avoided. When comorbid depression is alleviated at the same rate as pain, cost is around $18,960 per DALY avoided. Acupuncture as a substitute for standard care was not found to be cost-effective unless comorbid depression was included. According to the WHO cost-effectiveness threshold values, acupuncture is a cost-effective treatment strategy in patients with chronic LBP.

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ANALYSIS

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Background Information

Although evidence is mounting for the effectiveness of complimentary and alternative medicine (CAM) therapies, few have been incorporated into healthcare guidelines or subsidized by public health care systems. This may be due (at least in part) to the lack of studies on cost-effectiveness of these treatment options.

Individuals suffering from back pain, especially chronic low back pain (LBP), commonly make use of CAM therapies. Chronic LBP is a leading cause of disability, lost work days and activity restriction in individuals under 45 years of age, and is often associated with depression and sleep disturbance. As such, it is a key area for research evaluating the efficacy and cost effectiveness of CAM therapies.

When evaluating cost-effectiveness in health, a number of factors are considered, including: number of lives saved, number of disease cases averted, or number of life years gained per dollar expended. This can be generally expressed as the cost per disability-adjusted life-year (DALY) averted. This study aimed to assess the cost-effectiveness of acupuncture alone and as a complement to standard care for chronic LBP as a cost per DALY.

PERTINENT RESULTS

- Forty-one potential studies were identified, but only nine studies met the inclusion criteria (~ 4400 total subjects; study groups ranging from ~ 15 to > 1000).
- Meta-analysis of the studies where acupuncture and standard care was compared to standard care alone showed significantly larger improvements in pain with acupuncture combined with standard care.
- Studies where acupuncture and standard care were compared to standard care and sham acupuncture showed no significant differences.
- Studies where acupuncture alone was compared to standard care alone found a significant positive effect of acupuncture at week 8, but not at weeks 26 or 52.
- The overall cost of standard care was roughly $2000 for a 2-year period (all values in 2009 Australian dollars). This value was higher than other similar reports.
- The cost of acupuncture as a complement to standard care was shown to be cost-effective with a mean cost per DALY avoided of $48,562 [90% confidence interval: $28,500 to $76,900]. Remember, all values in Australian dollars.
- When comorbid depression was alleviated at the same rate as pain, acupuncture became even

more cost-effective with a mean cost of $18,960 per DALY avoided (90% CI: $11,100 to $30,000).
- When acupuncture was analyzed as a replacement for standard care it was not found to be cost-effective unless comorbid depression was included, at which point the mean cost was calculated as $62,946 per DALY avoided.

CLINICAL APPLICATION & CONCLUSIONS

Acupuncture demonstrates high cost-effectiveness in the treatment of chronic LBP when used in conjunction with conventional treatment, but not when used as an alternative to conventional treatments, except when comorbid depression was included (that is, the cost-effectiveness of acupuncture goes up when comorbid depression improves). Therefore, acupuncture still represents a reasonable adjunct treatment option for patients willing to undergo this method of treatment (not all patients like needles!).

It should be noted (again) that this analysis only considered direct costs. If indirect costs such as time lost from work and nonmedical cost were included, acupuncture might become more cost-effective again as it has been shown that reductions in pain and return to function, movement and mobility (all potential benefits of acupuncture) can facilitate a return to work and/or improved productivity. However, the impact of acupuncture on productivity outcomes was not included in the calculations performed in this study and would potentially be less influential in policy decision-making anyway, due to greater variability and uncertainty in these measures.

STUDY METHODS

The effectiveness of acupuncture was established through a literature review and meta-analysis including articles found through PubMed from its inception through Jan 2012. The authors also searched the bibliographies of the seven systematic reviews for additional references. In total, nine articles met the inclusion criteria, each was a randomized control trial with human subjects investigating acupuncture with manual or electronic stimulation, a comparator of standard or usual care, and a primary outcome measure of pain intensity (normally with a Visual Analogue Scale – VAS). Standard care included one or more of the following: physiotherapy, pain medication, back exercises, and/or education about back care. Studies without an intention to treat analysis, or those that utilized trigger point acupuncture or acupuncture combined with heat were excluded. Effect size was used as the main measure of effectiveness.

Only direct healthcare costs were included in the analysis. Indirect costs such as time lost from work and nonmedical costs were not included. For the purposes of this analysis, direct healthcare costs included average session costs for allied health professionals, estimated medication charges, and hospital charges.

Cost-effectiveness ratios were calculated as the incremental cost of the intervention divided by the incremental benefit and presented as incremental cost per DALY averted. The incremental cost was defined as the difference between the cost of the intervention (ex. acupuncture as a complement to standard care) and the cost of the comparator (ex. standard care). This can be expressed mathematically as:

(cost of the intervention) - (cost of comparator) = Incremental cost

Incremental cost/incremental benefit: DALY averted

The DALY was used as the outcome measure for health gain, as it captures both morbidity and mortality and is commonly used as a baseline for health status.

The World Health Organization (WHO) considers an intervention to be cost-effective when it costs less than three times the gross domestic product (GDP) per capita per DALY averted and highly cost-effective when it costs less than the GDP per capita per DALY averted.

STUDY STRENGTHS / WEAKNESSES

The need to apply the conversion factor method in order to translate the effect size of the intervention into a change in the DALY disability weight has both mathematical strengths and weaknesses. However, by using medical costs alone and not including indirect costs (ex. time lost from work) or non-medical costs in the analysis the authors have ensured that they have used a conservative effect to ensure that their results are applicable to real life.

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