Effectiveness of acupuncture for Parkinson disease: a systematic review

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CRD summary
The review concluded that there was no convincing evidence of effectiveness of acupuncture for treatment of Parkinson's disease. The authors' cautious conclusion reflected the data presented and appeared reasonable.

Authors' objectives
To assess the effectiveness of acupuncture as a treatment for Parkinson disease (PD).

Searching
MEDLINE, AMED, British Nursing Index, CINAHL, EMBASE, PsycINFO, The Cochrane Library 2007 (Issue 4), Korean Studies Information, DBPIA, Korea Institute of Science and Technology Information, Research Information Centre for Health Database, KoreaMed, Korean National Assembly Library, China Academic Journal, Century Journal Project, China Doctor/Master Dissertation Full Text, and China Proceedings Conference Full Text databases were searched from inception to January 2008 without language restriction. Search terms were reported. Departmental files and relevant journals were also searched up to December 2007 and bibliographies of retrieved articles were scanned for additional articles.

Study selection
Randomised controlled trials (RCTs) of patients with Parkinson disease treated with needle acupuncture with or without electrical stimulation were eligible for inclusion. Studies that used other forms of acupuncture (laser or moxibustion) or that compared two different forms of acupuncture were excluded. Included studies had to report clinical data.

Interventions in the included studies included acupuncture, electro-acupuncture, scalp acupuncture and abdominal acupuncture either alone or in conjunction with conventional drugs (levodopa). Comparison groups included placebo, no treatment and conventional drug therapy (levodopa). Outcomes assessed included change in Unified Parkinson's Disease Rating Scale (UPDRS), Activity of Daily Living scale (ADL), Parkinson's Disease Questionnaire (PDQ), Webster's Parkinson's Disease Rating Scale (WPDRS) and a modified version of WPDRS as well as quality of life, depression, freezing of gait and adverse events. Time since diagnosis varied between studies.

The authors reported neither how studies were selected for inclusion nor how many reviewers performed the selection.

Assessment of study quality
Validity was assessed using a modified Jadad Score of randomisation, appropriateness of randomisation method, blinding of patient and evaluator, withdrawals and dropouts (maximum 5 points). Studies that scored 3 or more points were categorised as high quality. Allocation concealment was assessed using the Cochrane classification.

Three reviewers, including two who could read and write Chinese, independently assessed validity. Discrepancies were resolved through discussion between two reviewers or through recourse to a third reviewer.

The quality of acupuncture was assessed based on answers to questions on treatment of patients. The degree of confidence that acupuncture was applied appropriately was assessed using the visual analogue scale: 0% meant that complete absence of evidence that acupuncture was appropriate; and 100% meant total certainty that acupuncture was appropriate. Quality of acupuncture was assessed independently by two reviewers. Discrepancies were resolved through discussion.

Data extraction
Data were extracted on baseline and improvement rate and used to calculate the mean change of total Unified Parkinson's Disease Rating Score (UPDRS). For categorical outcomes the relative risk (RR) and 95% confidence intervals (CI) were calculated based on UPDRS.
Outcomes were categorised as: positive (acupuncture was statistically significantly more effective than control in at least one Parkinson disease-related outcome); neutral (no significant difference between acupuncture and control group); and negative (acupuncture was significantly less effective than the control intervention). P<0.05 was considered to be statistically significant. Authors were contacted for additional information, where necessary.

Three reviewers, including two who could read and write Chinese, independently extracted data.

**Methods of synthesis**
In the absence of heterogeneity, weighted mean differences and relative risks, together with 95% CIs, were estimated using a random-effects model. $X^2$, $T^2$ and $I^2$ test were used to assess heterogeneity.

**Results of the review**
Eleven RCTs (n=408) were included in the review. Seven RCTs were reported to be of low quality. Six studies applied correct methods of randomisation. One RCT reported details on allocation concealment. One study reported patient and assessor blinding. Two studies reported patient blinding. Five studies reported sufficient details of drop-outs and withdrawals. The degree of confidence that acupuncture was applied appropriately ranged from 10% to 85%.

**Acupuncture versus placebo acupuncture (three RCTs):** There were no significant differences between groups in terms of UPDRS (three RCTs), quality of life and depression (one RCT), or for freezing of gait or activities of daily living (one RCT).

**Acupuncture plus conventional drugs versus conventional drugs only (six RCTs):** Scalp acupuncture was reported to be more effective than drug therapy only (RR 1.46, 95% CI 1.15 to 1.87; two RCTs). Scalp electro-acupuncture and needle acupuncture plus drug therapy was reported to be more effective than drug therapy alone (RR 2.07, 95% CI 1.22 to 3.51; two RCTs) and have a greater effect on UPDRS (WMD 13.56, 95% CI 3.88 to 23.25; two RCTs). Two RCTs reported no significant differences for acupuncture plus drug therapy for severity of Parkinson disease symptoms compared to drug therapy alone. Significantly fewer adverse events were noted for the acupuncture and drug therapy group compared to drug therapy alone (data not reported).

**Acupuncture versus no treatment (two RCTs):** Acupuncture was reported to be more effective on UPDRS compared with no treatment (WMD 7.36, 95% CI 5.58 to 9.14; two RCTs).

There was no evidence of statistical heterogeneity for any of the analyses.

**Authors’ conclusions**
The evidence for the effectiveness of acupuncture for the treatment of Parkinson disease was not convincing. The number and quality of studies as well as their total sample size was too low to draw firm conclusions.

**CRD commentary**
Inclusion criteria were clearly defined for intervention, participants, study design and outcomes. Several relevant databases were searched and efforts were made to reduce language and publication bias. Appropriate methods were used to reduce reviewer error and bias in the assessment of validity and extraction of data; it was unclear whether similar methods were used for the selection of studies. Validity was assessed using appropriate criteria and results of the assessment were reported. One of the main outcome measures reported (relative risk for treatment efficacy) was not clearly defined. Studies were combined in a meta-analysis and heterogeneity was assessed. Data from some studies were reported narratively. The authors’ cautious conclusion reflected the data presented and appeared reasonable.

**Implications of the review for practice and research**
**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that future RCTs of acupuncture for the treatment of Parkinson disease should adhere to accepted standards of trial methodology. In particular, future studies should have sufficiently large samples that were preferably based on formal power calculations based on appropriate pilot studies. Future studies should be of appropriate intervention duration and sufficient frequency and report all aspects of methodology in detail to ensure...
reproducibility. Validated primary outcome measures that evaluated functional benefit and quality of life should be used together with adequate statistical tests. Future studies should evaluate effectiveness of acupuncture compared with non-penetration sham acupuncture needles in the same acupoints with assessor blinding and allocation concealment to reduce the likelihood of bias.

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