Acupuncture for nocturnal enuresis in children: a systematic review and exploration of rationale
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CRD summary
This review evaluated the efficacy of acupuncture for nocturnal enuresis in children. The authors concluded that there was tentative evidence for the efficacy of acupuncture for childhood nocturnal enuresis. Given the limitations of the review and the included primary studies, the results and conclusions of the review may not be reliable.

Authors' objectives
To evaluate the efficacy of acupuncture for nocturnal enuresis in children.

Searching
MEDLINE, EMBASE, CISCOM, National Center for Complementary and Alternative Medicine, ProQuest, DARE, AMED, ACME, Chinese Biomedical Disc database, and a Japanese medical database were searched (1980 and 2003); the search terms were reported. Regional and national acupuncture conference proceedings, review articles, reference lists of identified trials and the contents of 40 journals were also searched. Reports in any language were considered, however, the authors stated that there was a focus on studies described in Asian languages.

Study selection
Study designs of evaluations included in the review
Randomised and non-randomised trials, prospective cohorts and alternative allocation trials were eligible for inclusion.

Specific interventions included in the review
Studies of acupuncture were eligible for inclusion. Electrotherapy applied away from recognised bladder, spleen or kidney puncture points was excluded. Inclusion criteria relating to the comparators were not specified. The included studies compared needle or laser acupuncture with auricular needle, seed or catgut embedding, saline or vitamin injections, photomagnetic laser, antidiuretic or herbal medication, laser acupuncture, or moxibustion. Where stated, the duration of treatment ranged from 2 weeks to 3 months.

Participants included in the review
Studies of children under the age of 18 years with nocturnal enuresis were eligible for inclusion. Studies of neurogenic bladder dysfunction, or of patients with active infection, inflammation, implanted neuromodulating devices, or structural or metabolic disorders that caused atypical urinary function, were excluded.

Outcomes assessed in the review
The primary outcome was the change in the number of wet nights per week following cessation of acupuncture, reported as the cure rate in the included studies. The secondary outcomes of interest were change in the number of spontaneous arousals to void per week and adverse events.

How were decisions on the relevance of primary studies made?
Two reviewers independently assessed studies for relevance.

Assessment of study quality
Study quality was assessed using the Jadad scale, which evaluates randomisation, allocation concealment, and the reporting of withdrawals and drop-outs, giving a score out of 5. The authors did not state how the quality of the studies was assessed, or how many reviewers performed the quality assessment.
Data extraction
The data were extracted into standardised forms. However, the authors did not state how many reviewers performed the data extraction. The number of people experiencing each outcome was extracted and used to calculate an odds ratio (OR) with 95% confidence intervals (CIs).

Methods of synthesis
How were the studies combined?
Pooled ORs and 95% CIs were calculated using a fixed-effect meta-analysis when no statistical heterogeneity was observed, and a random-effects meta-analysis (DerSimonian and Laird) when heterogeneity between studies was present. Two studies had three arms to the trials, and the control arm was used as a comparator for the two intervention arms in the same meta-analysis. Publication bias was assessed using funnel plots.

How were differences between studies investigated?
Heterogeneity was assessed using the chi-squared statistic. The authors stated that heterogeneity was explored using subgroup analyses, with only study quality identified a priori as a potential source of heterogeneity. Separate analyses were conducted for studies that evaluated acupuncture alone versus another therapy, acupuncture combined with other treatments compared with other treatments, and acupuncture compared with antidiuretic medication. Study heterogeneity could be observed using the forest plots provided.

Results of the review
Eleven studies (n=1,274) were included in the review, of which five were randomised trials. The other studies appeared to be controlled studies, but no details were given of the study design. Where stated, the follow-up ranged from 1 to 6 months.

The studies were of a poor quality. Five studies scored 1 on the Jadad scale, with the remaining studies scoring 0.

Acupuncture in conjunction with another treatment compared with the other treatment alone (3 studies).

Acupuncture produced a further statistically significant reduction in the number of wet nights (OR 3.98, 95% CI: 2.20, 7.20). There was no evidence of heterogeneity (P=0.45) or publication bias for this analysis.

Conventional acupuncture compared with other acupuncture techniques (8 studies).

There was no overall difference in the number of wet nights (OR 1.06, 95% CI: 0.60, 1.88). There was statistically significant heterogeneity between these studies (P<0.001). Four studies reported a significant difference between conventional acupuncture and the novel acupuncture, with conventional acupuncture being more effective than saline injections and seed embedding and less effective than needle embedding and vitamin injections (1 study each).

Laser acupuncture compared with diuretic medication (1 study).

There was no statistically significant difference in the number of wet nights.

Authors' conclusions
There was tentative evidence for the efficacy of acupuncture in the treatment of childhood nocturnal enuresis.

CRD commentary
The research question was clear in relation to the intervention, participants, outcomes and study design. An extensive search was undertaken, however, the authors stated that emphasis was placed on studies in Asian languages. It was unclear how this emphasis was applied and whether studies in other languages were excluded, therefore language bias may be present. Six studies were excluded as they compared two different types of acupuncture, whereas other studies comparing different types of acupuncture were included, and it was not clear how the distinction between these studies was made or why. Laser acupuncture was evaluated as a treatment in one study and used as comparator for needle
acupuncture in another. Although the study selection process was conducted in duplicate, thereby reducing the potential of selection bias, it was unclear whether attempts were also made to reduce reviewer error and bias at the data extraction and quality assessment stage. Study quality was assessed, although the Jadad scale might not have been the most appropriate quality tool to use.

There was inadequate information on the included studies to assess the comparability of the study populations. Randomised and non-randomised studies were combined using meta-analysis, despite significant heterogeneity and studies showing different direction of treatment effects. There was double-counting of control acupuncture groups in one of the meta-analyses. The authors stated that the heterogeneity between studies comparing different acupuncture techniques was likely to be due to varying efficacy of the different techniques evaluated. However, the clinical variation between these studies (such as the comparator used, follow-up time, treatment duration) might have been responsible for this heterogeneity, and this was not investigated. There were some inconsistencies in reporting between the tables, figures and text. The pooling of such statistically and clinically heterogeneous results might not have been appropriate. Given the limitations of the review and the included primary studies, the results and conclusions of the review should be treated with caution.

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

Research: The authors stated that more rigorous trials, to identify which parameters of acupuncture work best, are warranted.

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.