Review: Transcutaneous electrical nerve stimulation is not effective for chronic low-back pain

Milne S, Welch V, Brosseau L, et al. **Transcutaneous electrical nerve stimulation (TENS) for chronic low back pain.** Cochrane Database Syst Rev. 2001;(2):CD003008 (latest version 3 Aug 2000).

QUESTION

What is the effectiveness of transcutaneous electrical nerve stimulation (TENS) in the treatment of chronic low-back pain (LBP)?

DATA SOURCES

Studies were identified by searching MEDLINE, EMBASE/Excerpta Medica, the Physiotherapy Evidence Database (up to June 2000), and the Cochrane Controlled Trials Register (Issue 2, 2000). Bibliographies of relevant papers, *Current Contents* (up to week 21, 2000), specialized journals, and conference proceedings were hand searched. The coordinating offices of the trial registries of the Cochrane Field of Physical and Related Therapies and the Cochrane Musculoskeletal Group and content experts were contacted.

STUDY SELECTION

Studies were selected if they were randomized controlled trials (RCTs) evaluating the effectiveness of TENS for chronic LBP; included > 5 patients/group; used outpatients ≥ 18 years of age who had LBP of musculoskeletal origin for > 12 weeks of duration; and included outcome measures of pain, functional ability, well-being, disability, or satisfaction with care. Sham-TENS was considered to be an acceptable placebo comparison. Studies were excluded if patients received TENS percutaneously with acupuncture needles.

DATA EXTRACTION

Data were extracted independently by 2 reviewers on study design and quality, patient characteristics, device characteristics, application techniques, treatment duration, and outcomes.

MAIN RESULTS

5 RCTs were included; 251 patients received active TENS (153 by conventional mode and 98 by acupuncture-like TENS), and 170 received sham-TENS (placebo). Mean age ranged between 36 and 52 years, and mean time from onset of LBP ranged between 4 and 12 years. 2 trials reported having follow-up for 6 months. Outcome measures varied: 4 trials reported on pain or pain relief, 2 trials reported on physical measures (e.g., lumbar flexion or extension or "straight leg raising"), and 2 reported on disability. Treatment schedules varied from 1 treatment/d for 2 consecutive days to 3 treatments/d for 4 weeks. Data were pooled by using meta-analysis, and when possible, intention-to-treat data were used. Patients in the active TENS groups and those in the placebo-controlled groups did not differ for any outcome measure, even in subgroup analyses by TENS application and study quality. 3 trials (171 patients; 89 who received active TENS and 82 who received placebo) that measured pain by using a visual analog scale showed no difference in pain reduction between active TENS and placebo (relative differences of changes in pain from baseline ranged between 11% and 38%, favoring TENS).

CONCLUSION

Transcutaneous electrical nerve stimulation is not effective in the treatment of chronic low-back pain.

Sources of funding: Cigna Foundation, Philadelphia, and Medical Research Council of Canada.

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COMMENTARY

LBP affects over two thirds of adults at some point during their lifetime (1) and becomes chronic in 30% (2). Chronic LBP is characterized by intermittent exacerbations, but relatively few patients, even those with radicular findings, require surgery. Evaluating conservative treatments for chronic LBP requires rigorously designed studies because outcomes in uncontrolled trials may be confounded by the natural history.

Milne and colleagues' meta-analysis of RCTs concluded that TENS was not successful in treating chronic LBP. However, the analysis included only 5 trials comprising 421 patients. The authors pooled data across these trials but reported considerable variability in enrollment criteria, patient characteristics, treatment protocols, follow-up, and outcome measurements. Furthermore, the number of trials was insufficient to evaluate the effects of treatment duration and type of TENS application. Given the multiple device characteristics and application techniques for TENS, the meta-analysis does not exclude the possibility that TENS may be effective in some clinical settings.

Although treatment benefits were not statistically significant, patients in the TENS groups consistently reported less pain on visual analog scales than did patients in control groups. For now, TENS will likely remain a widely used treatment because it is safe and appealing to patients. Deyo and colleagues, in the highest-quality TENS study (3), found no statistically or clinically significant treatment effects. Nonetheless, after completing the study, nearly 70% of patients who received TENS and 56% of patients who received sham-TENS wished to continue with therapy.

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