Cochrane Database Syst Rev. 2017 Oct 9;10:CD012172. doi: 10.1002/14651858.CD012172.pub2. [Epub ahead of print]

Transcutaneous electrical nerve stimulation (TENS) for fibromyalgia in adults.

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Abstract

BACKGROUND:

Fibromyalgia is characterised by persistent, widespread pain; sleep problems; and fatigue. Transcutaneous electrical nerve stimulation (TENS) is the delivery of pulsed electrical currents across the intact surface of the skin to stimulate peripheral nerves and is used extensively to manage painful conditions. TENS is inexpensive, safe, and can be self-administered. TENS reduces pain during movement in some people so it may be a useful adjunct to assist participation in exercise and activities of daily living. To date, there has been only one systematic review in 2012 which included TENS, amongst other treatments, for fibromyalgia, and the authors concluded that TENS was not effective.

OBJECTIVES:

To assess the analgesic efficacy and adverse events of TENS alone or added to usual care (including exercise) compared with placebo (sham) TENS; no treatment; exercise alone; or other treatment including medication, electroacupuncture, warmth therapy, or hydrotherapy for fibromyalgia in adults.

SEARCH METHODS:

We searched the following electronic databases up to 18 January 2017: CENTRAL (CRSO); MEDLINE (Ovid); Embase (Ovid); CINAHL (EBSCO); PsycINFO (Ovid); LILACS; PEDRO; Web of Science (ISI); AMED (Ovid); and SPORTDiscus (EBSCO). We also searched three trial registries. There were no language restrictions.

SELECTION CRITERIA:

We included randomised controlled trials (RCTs) or quasi-randomised trials of TENS treatment for pain associated with fibromyalgia in adults. We included cross-over and parallel-group trial designs. We included studies that evaluated TENS administered using non-invasive techniques at intensities that produced perceptible TENS sensations during stimulation at either the site of pain or over nerve bundles proximal (or near) to the site of pain. We included TENS administered as a sole treatment or TENS in combination with other treatments, and TENS given as a single treatment or as a course of treatments.

DATA COLLECTION AND ANALYSIS:

Two review authors independently determined study eligibility by assessing each record and reaching agreement by discussion. A third review author acted as arbiter. We did not anonymise the records of studies before assessment. Two review authors independently extracted data and assessed risk of bias of included studies before entering information into a 'Characteristics of included studies' table. Primary outcomes were participant-reported pain relief from baseline of 30% or greater or 50% or greater, and Patient Global Impression of Change (PGIC). We assessed the evidence using GRADE and added 'Summary of findings' tables.

MAIN RESULTS:

We included eight studies (seven RCTs, one quasi-RCT, 315 adults (299 women), aged 18 to 75 years): six used a parallel-group design and two used a cross-over design. Sample sizes of intervention arms were five to 43 participants.Two studies, one of which was a cross-over design, compared TENS with placebo TENS (82 participants), one study compared TENS with no treatment (43 participants), and four studies compared TENS with other treatments (medication (two studies, 74 participants), electroacupuncture (one study, 44 participants), superficial warmth (one cross-over study, 32 participants), and hydrotherapy (one study, 10 participants)). Two studies compared TENS plus exercise with exercise alone (98 participants, 49 per treatment arm). None of the studies measured participant-reported pain relief of 50% or greater or PGIC. Overall, the studies were at unclear or high risk of bias, and in particular all were at high risk of bias for sample size.Only one study (14 participants) measured the primary outcome participant-reported pain relief of 30% or greater. Thirty percent achieved 30% or greater reduction in pain with TENS and exercise compared with 13% with exercise alone. One study found 10/28 participants reported pain relief of 25% or greater with TENS compared with 10/24 participants using superficial warmth (42 °C). We judged that statistical pooling was not possible because there were insufficient data and outcomes were not homogeneous.There were no data for the primary outcomes participant-reported pain relief from baseline of 50% or greater and PGIC.There was a paucity of data for secondary outcomes. One pilot cross-over study of 43 participants found that the mean (95% confidence intervals (CI)) decrease in pain intensity on movement (100-mm visual analogue scale (VAS)) during one 30-minute treatment was 11.1 mm (95% CI 5.9 to 16.3) for TENS and 2.3 mm (95% CI 2.4 to 7.7) for placebo TENS. There were no significant differences between TENS and placebo for pain at rest. One parallel group study of 39 participants found that mean ± standard deviation (SD) pain intensity (100-mm VAS) decreased from 85 ± 20 mm at baseline to 43 ± 20 mm after one week of dual-site TENS; decreased from 85 ± 10 mm at baseline to 60 ± 10 mm after single-site TENS; and decreased from 82 ± 20 mm at baseline to 80 ± 20 mm after one week of placebo TENS. The authors of seven studies concluded that TENS relieved pain but the findings of single small studies are unlikely to be correct.One study found clinically important improvements in FibromyalgiaImpact Questionnaire (FIQ) subscales for work performance, fatigue, stiffness, anxiety, and depression for TENS with exercise compared with exercise alone. One study found no additional improvements in FIQ scores when TENS was added to the first three weeks of a 12-week supervised exercise programme.No serious adverse events were reported in any of the studies although there were reports of TENS causing minor discomfort in a total of 3 participants.The quality of evidence was very low. We downgraded the GRADE rating mostly due to a lack of data; therefore, we have little confidence in the effect estimates where available.

AUTHORS' CONCLUSIONS:

There was insufficient high-quality evidence to support or refute the use of TENS for fibromyalgia. We found a small number of inadequately powered studies with incomplete reporting of methodologies and treatment interventions.