Review > Cochrane Database Syst Rev. 2015 Jun 15;(6):CD006142.

doi: 10.1002/14651858.CD006142.pub3.

Transcutaneous electrical nerve stimulation for acute pain

Mark I Johnson [1], Carole A Paley, Tracey E Howe, Kathleen A Sluka

Affiliations

PMID: 26075732 DOI: 10.1002/14651858.CD006142.pub3

Abstract

Background: This is a second update of a Cochrane Review originally published in Issue 2, 2009. Transcutaneous Electrical Nerve Stimulation (TENS) is a non-pharmacological agent, based on delivering low voltage electrical currents to the skin. TENS is used by people to treat a variety of pain conditions.

Objectives: To assess the analgesic effectiveness of TENS, as a sole treatment, for acute pain in adults.

Search methods: We searched the following databases up to 3 December 2014: the Cochrane Central Register of Controlled Trials (CENTRAL), in the Cochrane Library; MEDLINE; EMBASE; CINAHL; and AMED. We also checked the reference lists of included trials.

Selection criteria: We included randomised controlled trials (RCTs) of adults with acute pain (< 12 weeks) if they examined TENS given as a sole treatment and assessed pain with subjective pain scales. Trials were eligible if they compared TENS to placebo TENS, no treatment controls, pharmacological interventions or non-pharmacological interventions. We excluded trials on experimental pain, case reports, clinical observations, letters, abstracts or reviews. Also we excluded trials investigating the effect of TENS on pain during childbirth (labour), primary dysmenorrhoea or dental procedures. Studies where TENS was given with another treatment as part of the formal trial design were excluded. We did not restrict any articles based on language of publication.

Data collection and analysis: Two review authors independently assessed study eligibility and carried out study selection, data extraction, 'Risk of bias' assessment and analyses of data. We

extracted data on the following: types of participants and pain condition, trial design and methods, treatment parameters, adverse effects, and outcome measures. We contacted trial authors for additional information if necessary.

Main results: We included 12 trials in the original review (2009) and included no further trials in the first update (2011). An additional seven new trials met the inclusion criteria in this second update. In total, we included 19 RCTs involving 1346 participants at entry, with 11 trials awaiting classification either because the full text was unavailable or information in the full text failed to clarify eligibility. We excluded most trials because TENS was given in combination with another treatment as part of the formal study design or TENS was not delivered using appropriate TENS technique. The types of acute pain included in this Cochrane Review were procedural pain, e.g. cervical laser treatment, venepuncture, screening flexible sigmoidoscopy and non-procedural pain, e.g. postpartum uterine contractions and rib fractures. We pooled data for pain intensity for six trials (seven comparisons) comparing TENS with placebo but the I(2) statistic suggested substantial heterogeneity. Mean difference (MD) with 95% confidence intervals (CIs) on a visual analogue scale (VAS, 100 mm) was -24.62 mm (95% CI -31.79 to -17.46) in favour of TENS. Data for the proportion of participants achieving ≥ 50% reduction in pain was pooled for four trials (seven comparisons) and relative risk was 3.91 (95% CI 2.42 to 6.32) in favour of TENS over placebo. We pooled data for pain intensity from five trials (seven comparisons) but the I(2) statistic suggested considerable heterogeneity. MD was -19.05 mm (95% CI -27.30 to -10.79) in favour of TENS using a random-effects model. It was not possible to pool other data. There was a high risk of bias associated with inadequate sample sizes in treatment arms and unsuccessful blinding of treatment interventions. Seven trials reported minor adverse effects, such as mild erythema and itching underneath the electrodes and participants disliking TENS sensation.

Authors' conclusions: This Cochrane Review update includes seven new trials, in addition to the 12 trials reviewed in the first update in 2011. The analysis provides tentative evidence that TENS reduces pain intensity over and above that seen with placebo (no current) TENS when administered as a stand-alone treatment for acute pain in adults. The high risk of bias associated with inadequate sample sizes in treatment arms and unsuccessful blinding of treatment interventions makes definitive conclusions impossible. There was incomplete reporting of treatment in many reports making replication of trials impossible.

Update of

Transcutaneous electrical nerve stimulation for acute pain.

Walsh DM, Howe TE, Johnson MI, Sluka KA.

Cochrane Database Syst Rev. 2009 Apr 15;(2):CD006142. doi: 10.1002/14651858.CD006142.pub2.

PMID: 19370629 Updated. Review.

Related information

Cited in Books

MedGen

LinkOut - more resources

Full Text Sources

Wiley

Medical

ClinicalTrials.gov

Research Materials

NCI CPTC Antibody Characterization Program

Miscellaneous

NCI CPTAC Assay Portal