Cochrane Library

Cochrane Database of Systematic Reviews

Transcutaneous electrostimulation for osteoarthritis of the knee (Review)

Rutjes AWS, Nüesch E, Sterchi R, Kalichman L, Hendriks E, Osiri M, Brosseau L, Reichenbach S, Jüni P

Rutjes AWS, Nüesch E, Sterchi R, Kalichman L, Hendriks E, Osiri M, Brosseau L, Reichenbach S, Jüni P.
Transcutaneous electrostimulation for osteoarthritis of the knee.
Cochrane Database of Systematic Reviews 2009, Issue 4. Art. No.: CD002823.
DOI: 10.1002/14651858.CD002823.pub2.

www.cochranelibrary.com

WILEY

[Intervention Review]

Transcutaneous electrostimulation for osteoarthritis of the knee

Anne WS Rutjes[1], Eveline Nüesch[1], Rebekka Sterchi[1], Leonid Kalichman[2], Erik Hendriks[3], Manathip Osiri[4], Lucie Brosseau[5], Stephan Reichenbach[6], Peter Jüni[1]

[1]Division of Clinical Epidemiology and Biostatistics, Institute of Social and Preventive Medicine, University of Bern, Bern, Switzerland. [2]Department of Physical Therapy, Recanati School for Community Health Professions, Faculty of Health Sciences, Ben-Gurion University of the Negev, Beer Sheva, Israel. [3]Epidemiology Department, Maastricht University, Maastricht, Netherlands. [4]Department of Medicine, Faculty of Medicine, Bangkok, Thailand. [5]School of Rehabilitation Sciences, Faculty of Health Sciences, University of Ottawa, Ottawa, Canada. [6]Department for Rheumatology, Clinical Immunology, and Allergology, University Hospital, Bern, Switzerland

Contact address: Anne WS Rutjes, Division of Clinical Epidemiology and Biostatistics, Institute of Social and Preventive Medicine, University of Bern, Finkenhubelweg 11, Bern, 3012, Switzerland. arutjes@ispm.unibe.ch, a.rutjes@crc-cesi.org.

Editorial group: Cochrane Musculoskeletal Group.
Publication status and date: Edited (no change to conclusions), published in Issue 1, 2010.

Citation: Rutjes AWS, Nüesch E, Sterchi R, Kalichman L, Hendriks E, Osiri M, Brosseau L, Reichenbach S, Jüni P. Transcutaneous electrostimulation for osteoarthritis of the knee. *Cochrane Database of Systematic Reviews* 2009, Issue 4. Art. No.: CD002823. DOI: 10.1002/14651858.CD002823.pub2.

ABSTRACT

Background

Osteoarthritis is the most common form of joint disease and the leading cause of pain and physical disability in the elderly. Transcutaneous electrical nerve stimulation (TENS), interferential current stimulation and pulsed electrostimulation are used widely to control both acute and chronic pain arising from several conditions, but some policy makers regard efficacy evidence as insufficient.

Objectives

To compare transcutaneous electrostimulation with sham or no specific intervention in terms of effects on pain and withdrawals due to adverse events in patients with knee osteoarthritis.

Search methods

We updated the search in CENTRAL, MEDLINE, EMBASE, CINAHL and PEDro up to 5 August 2008, checked conference proceedings and reference lists, and contacted authors.

Selection criteria

Randomised or quasi-randomised controlled trials that compared transcutaneously applied electrostimulation with a sham intervention or no intervention in patients with osteoarthritis of the knee.

Data collection and analysis

We extracted data using standardised forms and contacted investigators to obtain missing outcome information. Main outcomes were pain and withdrawals or dropouts due to adverse events. We calculated standardised mean differences (SMDs) for pain and relative risks for safety outcomes and used inverse-variance random-effects meta-analysis. The analysis of pain was based on predicted estimates from meta-regression using the standard error as explanatory variable.

Main results

In this update we identified 14 additional trials resulting in the inclusion of 18 small trials in 813 patients. Eleven trials used TENS, four interferential current stimulation, one both TENS and interferential current stimulation, and two pulsed electrostimulation. The

methodological quality and the quality of reporting was poor and a high degree of heterogeneity among the trials (I^2 = 80%) was revealed. The funnel plot for pain was asymmetrical (P < 0.001). The predicted SMD of pain intensity in trials as large as the largest trial was -0.07 (95% CI -0.46 to 0.32), corresponding to a difference in pain scores between electrostimulation and control of 0.2 cm on a 10 cm visual analogue scale. There was little evidence that SMDs differed on the type of electrostimulation (P = 0.94). The relative risk of being withdrawn or dropping out due to adverse events was 0.97 (95% CI 0.2 to 6.0).

Authors' conclusions

In this update, we could not confirm that transcutaneous electrostimulation is effective for pain relief. The current systematic review is inconclusive, hampered by the inclusion of only small trials of questionable quality. Appropriately designed trials of adequate power are warranted.

PLAIN LANGUAGE SUMMARY

Transcutaneous electrostimulation for osteoarthritis of the knee

This summary of a Cochrane review presents what we know from research about the effect of transcutaneous electrostimulation on osteoarthritis of the knee.

The review shows that in people with osteoarthritis:

- We are uncertain whether transcutaneous electrostimulation affects pain or your ability to use your knee because of the very low quality of the evidence.
- Transcutaneous electrostimulation may not have any side effects. We often do not have precise information about side effects and complications. This is particularly true for rare but serious side effects.

What is osteoarthritis and what is transcutaneous electrostimulation?

Osteoarthritis (OA) is a disease of the joints, such as your knee. When the joint loses cartilage, the bone grows to try and repair the damage. Instead of making things better, however, the bone grows abnormally and makes things worse. For example, the bone can become misshapen and make the joint painful and unstable. This can affect your physical function or ability to use your knee.

Transcutaneous electrostimulation, such as TENS, is a kind of pain relief typically using electrical currents applied to the skin. Transcutaneous electrostimulation machines are typically small, battery-operated machines with 2 electrodes attached. Electrodes are wires that send the electrical current. Usually, you connect two electrodes from the machine to your skin on the painful area. Your doctor or physiotherapist will show you how to use it, and most machines can be used at home.

Best estimate of what happens to people with osteoarthritis who use transcutaneous electrostimulation up to 4 weeks after using it:

Pain

- People who used electrostimulation had an improvement in their pain of about 2 on a scale from 0 (no pain) to 10 (extreme pain) 4 weeks after using it.

- People who used a fake electrostimulation machine or just took their usual treatments had an improvement in their pain of about 2 on a scale from 0 (no pain) to 10 (extreme pain) 4 weeks after using it.

- People had no more average improvement when using electrostimulation, and no more people responded to treatment with electrostimulation compared with people who used a fake electrostimulation machine or just took their usual treatments (difference of 0%).

Physical Function

- People who used electrostimulation had an improvement in their physical function of about 2 on a scale from 0 (no disability) to 10 (extreme disability) 4 weeks after using it.

- People who used a fake electrostimulation machine or just took their usual treatments had an improvement in their physical function of about 1 on a scale from 0 (no disability) to 10 (extreme disability) 4 weeks after using it.

- People using electrostimulation had 1 unit more improvement in their knee function when compared to people who used a fake electrostimulation machine or just took their usual treatments.

Another way of saying this is:

- 29 people out of 100 who used electrostimulation respond to treatment (29%).

- 26 people out of 100 who used a fake electrostimulation machine or just took their usual treatments respond to treatment (26%).

- 3 more people respond to treatment with electrostimulation compared with people who used a fake electrostimulation machine or just took their usual treatments (difference of 3%).

Dropouts or withdrawals from the trial because of side effects

- 2 people out of 100 who used electrostimulation dropped out or withdrew from the trial because of side effects (2%).

- 2 people out of 100 who used a fake electrostimulation machine or just took their usual treatments dropped out of the trial because of side effects (2%).

- There was no difference in the number of people who dropped out of the trial because of side effects (difference of 0%). This could be the result of chance.

Side effects

- 15 people out of 100 who used electrostimulation experienced side effects (15%).

- 15 people out of 100 who used a fake electrostimulation machine or just took their usual treatments experienced side effects (15%).

- There was no difference in the number of people who experience side effects (difference of 0%). This could be the result of chance.