TITLE: Transcutaneous Electrical Nerve Stimulator for Diabetic Neuropathy: Clinical Effectiveness and Cost Effectiveness

DATE: 18 July 2011

RESEARCH QUESTIONS

1. What is the clinical effectiveness of the transcutaneous electrical nerve stimulator machine for treating painful diabetic neuropathy?

2. What is the cost-effectiveness of the transcutaneous electrical nerve stimulator machine for treating painful diabetic neuropathy?

KEY MESSAGE

The findings of the identified studies were inconsistent; therefore, no conclusions regarding the effectiveness of the transcutaneous electrical nerve stimulator machine for treating painful diabetic neuropathy can be made. No literature was identified regarding the cost-effectiveness of the transcutaneous electrical nerve stimulator machine for treating painful diabetic neuropathy.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2011, Issue 7), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2006 and July 4, 2011. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.
RESULTS

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials (RCTs), non-randomized studies, and economic evaluations.

The literature search identified one meta-analysis, two randomized controlled trials, and two non-randomized studies. No relevant health technology assessments, systematic reviews, or economic evaluations were identified. Additional literature that may be of interest is located in the appendix.

OVERALL SUMMARY OF FINDINGS

One meta-analysis\(^1\) evaluating the effectiveness of transcutaneous electrical nerve stimulation (TENS) for diabetic peripheral neuropathy (DPN) included RCTs comparing TENS with routine care, pharmacological interventions, or placebo devices for patients with symptomatic DPN. Reduction in mean pain scores were significantly greater in the TENS group compared to placebo in all weekly margins except at 12 weeks. The authors could make no clear conclusion regarding the effectiveness of TENS.

One RCT\(^2\) assessed the effect of TENS in reducing neuropathic pain in patients with DPN. The authors concluded there were no statistically significant differences between groups regarding pain intensity, pain disability, and quality of life; therefore, they concluded the effectiveness of TENS in reducing pain was not superior to a placebo treatment. The second RCT\(^3\) sought to determine the efficacy of electrical nerve stimulation machines (TENS and Diadynamic) on pain relief for patients with painful diabetic poly neuropathy. The authors concluded that TENS and Diadynamic may reduce pain in some patients; however, no significant differences in pain reduction were observed in the TENS, Diadynamic, or the placebo groups.

One non-randomized study\(^4\) investigated the effects of high rate frequency modulation with TENS treatment for patients with diabetic polyneuropathy. The authors concluded that TENS treatment had a positive effect on diabetic polyneuropathy based on a significant difference in glucose values before and after treatment. The second non-randomized study\(^5\) aimed to determine if TENS improved function of the A-delta or A-beta fibers of afferent nerves. The effect of TENS was evaluated with cold and heat pain thresholds, in addition to vibration perception and touch perception thresholds. The authors found no statistically significant changes in pain and perception thresholds in the stimulated areas.
REFERENCES SUMMARIZED

Health technology assessments
No literature identified.

Systematic reviews and meta-analyses


Randomized controlled trials


Non-randomized studies


Economic evaluations
No literature identified.

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APPENDIX – FURTHER INFORMATION:

Review articles


