Effectiveness of the anodyne therapy system in treating diabetic peripheral neuropathy: a systematic review

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CRD summary
This review concluded that anodyne therapy system for patients with diabetic peripheral neuropathy may be effective for improving lower extremity sensation, reducing pain, improving standard balance and decreasing fall risk. The authors’ conclusions appeared to reflect the limited evidence, but given the possibility of bias, uncertainty over the review methods and poor study quality, should be interpreted with caution.

Authors' objectives
To assess the efficacy of the anodyne therapy system (ATS) for treating patients with diabetic peripheral neuropathy.

Searching
MEDLINE, CINAHL and The Cochrane Library were searched between 1986 and 2006; search terms were reported. Physical Therapy website and Journal of the American Physical Therapy Association were searched between 1986 and 2006. Only English-language studies were included.

Study selection
Prospective or retrospective experimental studies or case histories that assessed anodyne therapy system or monochromatic infrared energy at 890nm wavelength in patients with diabetic peripheral neuropathy were eligible for inclusion.

Patients in included studies used either clinical or home anodyne therapy system devices. Most studies focused on patients who had either type I or II diabetes mellitus. Most studies required that patients had some kind of sensory impairment at the outset of the study; Semmes-Weinstein monofilaments was the most frequently used technique for evaluating sensory impairment levels. Where stated, mean duration of disease ranged from two to 16 years. Few studies reported whether the onset of disease was genetic or acquired. Average age ranged from 60.4 to 78 years.

The authors stated neither how studies were selected for the review nor how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they assessed study quality.

Data extraction
Pre- and post-intervention assessments were extracted for each study. It was not stated how many reviewers performed the data extraction.

Methods of synthesis
Studies were combined in a narrative synthesis.

Results of the review
Ten studies were included (n=3,991, range one to 2,239): two double blind randomised controlled trials (RCTs); three experimental studies; four retrospective chart reviews; and one case report.

Nine studies reported favourable results for anodyne therapy system. However, one of the two RCTs did not report a significant difference between anodyne therapy system and placebo.

Authors' conclusions
Anodyne therapy system treatment may be effective for improving lower extremity sensation, reducing pain, improving
standard balance and decreasing fall risk.

**CRD commentary**
This review addressed a clear objective supported by defined inclusion criteria for patients, study design and interventions, but not for outcomes. Relevant sources were searched for English-language studies, so there was a possibility of language bias. Some studies may have been missed as the authors did not undertake an extensive search for unpublished studies. It was unclear whether appropriate steps were taken to reduce reviewer error and bias in the selection of studies and data extraction. Study quality was not formally assessed and so the reliability of the included studies was unclear. Some quality criteria were discussed within the review and (as acknowledged by the authors) shortcomings among the included studies included poor study designs, small sample sizes (most studies had <50 participants), limited information on treatment volume or intensity, concomitant use of conventional physical therapy modalities and a lack of long-term follow-up. A narrative synthesis was appropriate given the differences between studies.

The authors’ conclusions appeared to reflect the limited evidence, but the possibility of bias, uncertainty over the review methods and poor study quality suggest that these should be interpreted with caution.

**Implications of the review for practice and research**
The authors did not state any implications for practice.

**Research:** The authors stated that large well-designed placebo-controlled RCTs were required to determine the effectiveness of anodyne therapy system for treating patients with diabetic peripheral neuropathy. Such studies should provide more information regarding patient disease or condition characteristics, as well as improved standardisation of pre-treatment sensory impairment, balance and fall risk measurements and improved control of concomitant therapies.

**Funding**
Not stated.

**Bibliographic details**

**DOI**
10.1179/174328808X356429

**Indexing Status**
Subject indexing assigned by CRD

**MeSH**
Diabetic Neuropathies; Humans; Infrared Rays; Pain /prevention & control; Phototherapy

**AccessionNumber**
12009104081

**Date bibliographic record published**
16/12/2009

**Date abstract record published**
25/08/2010

**Record Status**
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on
the reliability of the review and the conclusions drawn.