Vitamin B for treating peripheral neuropathy (Review)

Ang CD, Alviar MJM, Dans AL, Bautista-Velez GGP, Villaruz-Sulit MVC, Tan JJ, Co HU, Bautista MRM, Roxas AA

This is a reprint of a Cochrane review, prepared and maintained by The Cochrane Collaboration and published in *The Cochrane Library* 2008, Issue 4

http://www.thecochranelibrary.com

[Intervention Review]

Vitamin B for treating peripheral neuropathy

Cynthia D Ang[1], Maria Jenelyn M Alviar[2], Antonio L Dans[3], Gwyneth Giselle P Bautista-Velez[4], Maria Vanessa C Villaruz-Sulit[5], Jennifer J Tan[6], Homer U Co[7], Maria Rhida M Bautista[8], Artemio A Roxas[9]

[1]Department of Rehabilitation Medicine, University of the Philippines - College of Medicine and Philippine General Hospital, Manila, Philippines. [2]Department of Rehabilitation Medicine, Philippine General Hospital, Manila, Philippines. [3]Section of Adult Medicine, College of Medicine, University of the Philippines, Ermita, Philippines. [4]Section of Allergy and Immunology, Department of Medicine, University of the Philippines - College of Medicine and Philippine General Hospital, Quezon City, Philippines. [5]Section of Adult Medicine, Department of Medicine, University of the Philippines - College of Medicine and Philippine General Hospital, Ermita, Manila, Philippines. [6]Department of Internal Medicine, Harlem Medical Center, New York, New York, USA. [7]Department of Medicine, University of the Philippines - College of Medicine and Philippine General Hospital, Ermita, Manila, Philippines. [8]Junior Medical Staff Unit, Royal North Shore Hospital, St Leonards, Australia. [9]Department of Neurosciences, University of the Philippines - College of Medicine and Philippine General Hospital, Pasig City, Philippines

Contact address: Cynthia D Ang, Department of Rehabilitation Medicine, University of the Philippines - College of Medicine and Philippine General Hospital, Taft Avenue, Ermita, Manila, 1000, Philippines. cdang@info.com.ph.

Editorial group: Cochrane Neuromuscular Disease Group.
Publication status and date: Edited (no change to conclusions), published in Issue 4, 2008.
Review content assessed as up-to-date: 31 August 2005.

Citation: Ang CD, Alviar MJM, Dans AL, Bautista-Velez GGP, Villaruz-Sulit MVC, Tan JJ, Co HU, Bautista MRM, Roxas AA. Vitamin B for treating peripheral neuropathy. *Cochrane Database of Systematic Reviews* 2008, Issue 3. Art. No.: CD004573. DOI: 10.1002/14651858.CD004573.pub3.

ABSTRACT

Background

Vitamin B is frequently used for treating peripheral neuropathy but its efficacy is not clear.

Objectives

The objective of this review was to assess the effects of vitamin B for treating generalised peripheral neuropathy.

Search methods

We searched the Cochrane Neuromuscular Disease Group Trials Register (searched August 2005), MEDLINE (January 1966 to September 2005), EMBASE (January 1980 to September 2005), Philippine databases (searched September 2005) and reference lists of articles. We also contacted manufacturers and researchers in the field.

Selection criteria

Randomised and quasi-randomised trials where vitamin B was compared with placebo or another treatment in generalised peripheral neuropathy.

Data collection and analysis

Two authors independently assessed trial quality and extracted data. We contacted study authors for additional information.

Main results

Thirteen studies involving 741 participants with alcoholic or diabetic neuropathy were included. In the comparison of vitamin B with placebo, two small trials showed no significant short-term benefit in pain intensity while one of the trials showed a small significant benefit in vibration detection from oral benfotiamine, a derivative of thiamine. In the larger of two trials comparing different doses of vitamin B complex, there was some evidence that higher doses resulted in a significant short-term reduction in pain and improvement in paraesthesiae, in a composite outcome combining pain, temperature and vibration, and in a composite outcome combining pain, numbness and paraesthesiae. There was some evidence that vitamin B is less efficacious than alpha-lipoic acid, cilostazol or cytidine triphosphate in the short-term improvement of clinical and nerve conduction study outcomes but the trials were small. There were few minor adverse effects reported.

Authors' conclusions

There are only limited data in randomised trials testing the efficacy of vitamin B for treating peripheral neuropathy and the evidence is insufficient to determine whether vitamin B is beneficial or harmful. One small trial in alcoholic peripheral neuropathy reported slightly greater improvement in vibration perception threshold with oral benfotiamine for eight weeks than placebo. In another small study, a higher dose of oral vitamin B complex for four weeks was more efficacious than a lower dose in reducing symptoms and signs. Vitamin B administered by various routes for two to eight weeks was less efficacious than alpha-lipoic acid, cilostazol or cytidine triphosphate in short-term improvement of clinical and nerve conduction study outcomes. Vitamin B is generally well-tolerated.

PLAIN LANGUAGE SUMMARY

Vitamin B for treating disorders of the peripheral nerves

Peripheral neuropathy is a disorder of the peripheral nerves resulting from different causes, such as diabetes mellitus and alcoholism, leading to pain, numbness or weakness of the limbs and other problems. Vitamin B is commonly used to treat peripheral neuropathy but it is not clear if it helps. This review of 13 trials on diabetic and alcoholic peripheral neuropathy with a total of 741 participants showed only one study that suggested possible short-term benefit from eight-week treatment with benfotiamine (a derivative of vitamin B1) with slightly greater improvement in vibration perception threshold compared to placebo. Vitamin B complex when given in a higher dose administered for four weeks was more efficacious than a lower dose in reducing pain and other clinical problems based on another study. Two to eight weeks of treatment with vitamin B was less efficacious than alpha-lipoic acid, cilostazol or cytidine triphosphate in short-term improvement of clinical and nerve test findings. All these findings require confirmation in larger studies before they can be accepted as definite. Vitamin B is generally well-tolerated with only a few reports of mild side effects.

BACKGROUND

The term 'peripheral neuropathy' has been used to cover any disorder of the peripheral nervous system which may affect the sensory, motor or autonomic functions but this review focused on generalised peripheral neuropathies. The prevalence is estimated at 2400 per 100,000, increasing with age to 8000 per 100,000 (Hughes 2002). The common causes are diabetes, alcohol, human immunodeficiency virus infection, and, in some parts of the world, leprosy.

The availability and affordability of vitamin B complex makes this drug a frequent choice for treating peripheral neuropathy. Strong evidence in the literature on the efficacy of vitamin B complex, however, is lacking. The vitamin B complex is a group of water-soluble compounds that differ in chemical structure and biological action. Traditionally, the vitamin B complex includes: thiamine (vitamin B1), riboflavin (vitamin B2), nicotinic acid (vitamin B3), pantothenic acid (vitamin B5), pyridoxine (vitamin B6), biotin (vitamin B7), folic acid (vitamin B9), cyanocobalamin (vitamin B12), para-aminobenzoic acid, inositol, and choline (Marcus 1996).

Some vitamin B compounds have derivatives. Benfotiamine is a lipid-soluble derivative of vitamin B1 which is better absorbed after oral administration than the water-soluble thiamine salts resulting in higher levels of the active compound in blood and tissues (Stracke 1996). Vitamin B12 has several congeners: cyanocobal-