

Effects of Vitamin E on neuropathic Pain in Diabetic neuropathy

Diabetic peripheral neuropathy (DPN) tends to go undiagnosed and untreated.[1] It affects 26 per cent to 53 per cent of diabetic individuals worldwide, representing a substantial public health threat.2 The significant strategies for managing DPN are improved glycaemic control and pain management.[3]

Management of painful diabetic peripheral neuropathy remains challenging. However, DPN can be treated with a variety of pharmaceutical treatments.[4] When used alone or in combination, these therapies produce varying degrees of satisfactory results, but they are limited in part by their side effects.[5] They are primarily used for symptom alleviation and have little effect on the underlying neuropathic process. In the pathophysiology of DPN, oxidative stress plays a significant role.[6] Alternative agents such as lipoic acid (ALA), benfotiamine, acetyl-L-carnitine, vitamin E, vitamin D2, and actovegin have been examined with varying findings.[7-12]

ROLE OF VITAMIN E IN DM

In various animal, human, and experimental models of diabetes, oxidative stress has been implicated in nerve damage.[13-15] Increased reactive oxygen and nitrogen species can damage lipids present in myelinated nerve structures, resulting in axon loss and disruption of the peripheral nervous system's microvasculature.[16] Vitamin E, which is made up of powerful lipophilic antioxidants like tocopherols and tocotrienols, has also been reported to help with the unpleasant symptoms of DM's neuropathic consequences. [17,18] For the treatment of DMN, a daily dose of 500-1000 mg of EP oil is indicated. Vitamin E is available in soft gel form, similar to EP oil, and is typically given 400 mg for DMN.[19] Ogbera AO et al. demonstrated that the combination of vitamin E and EP oil is effective and safe in treating mild to moderate neuropathy.[19]

Another study by Rajanandh MG et al. reported that Vitamin-E is more helpful in relieving pain in diabetic neuropathy patients over 50 years old than in diabetic neuropathy patients under 50 years old after the 12th week of treatment.[20] It was linked to vitamin-antioxidant E's properties, which have been demonstrated to be helpful in older people.[20,21] Furthermore, it reveals that in diabetic neuropathy, a longer course of treatment is required to reduce pain and improve quality of life.[20, 22, 23]

The results of a randomized, double-blind, placebo-controlled study that looked at the effect of vitamin E on nerve function in 21 types 2 diabetes individuals with mild-to-moderate neuropathy found that symptoms were reduced.[24]

Vitamin E affects the balance between degeneration and regeneration shifts towards more regeneration.[25] Antioxidant therapy with vitamin E may inhibit the free radical-induced endoneurial damage and improve antioxidant tone in individuals whom the capacity is defective due to the polyol pathway (Figure 1).[26] Vitamin E in such conditions may prove helpful in improving nerve health and reducing nerve associated symptoms such as neuropathic pain.[20]

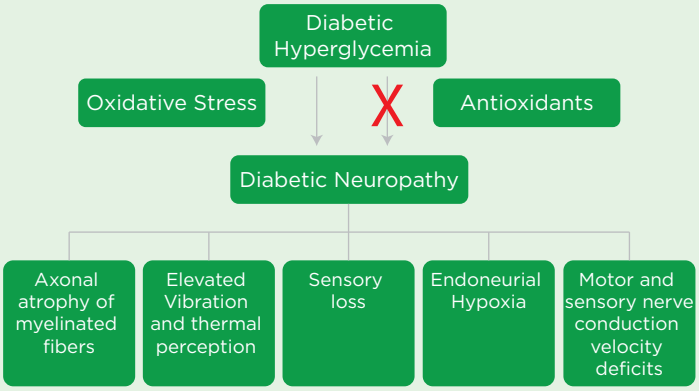

Figure 1: A simplified scheme showing the roles of reactive species and antioxidants in the progression of diabetic neuropathy.[28]

TAKE-HOME MESSAGE

- There is substantial evidence that the induction of oxidative stress is a critical process in developing diabetic complications like neuropathy.
- Vitamin E helps reduce neuropathic pain in diabetic patients above 50 years of age.
- Most of the time, dietary intake of vitamin E remains insufficient. In such cases, health care practitioners should encourage patients with diabetes to increase their vitamin E intake by consuming vitamin-rich food or otherwise prescribing supplements.

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