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Original research article

The effects of vitamın D, C, E and zinc supplements in chronic low back pain

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Abstract

The vast majority of people have some level of back discomfort. After headache, the most prevalent type of patient complaint is one that involves pain. Chronic pain in the lower back (also known as CLBP) typically worsens with time, and it can be difficult to establish or verify the underlying cause of the condition. Despite the availability of extremely invasive treatment choices, a substantial number of patients continue to suffer as a result of a considerable amount of mortality. This is the case despite the fact that there are a great deal of pharmacological possibilities. A lack of vitamin D has been linked to recurrent pain in the musculoskeletal system, which can manifest itself as low back pain. Pain in the Back (LBP). Inadequate amounts of vitamin D have been shown to have harmful impacts on the body's mobility, both directly and indirectly as a result of the body's capacity to feel and experience pain. When compared to those in the general population, individuals who suffer from chronic low back pain have a much higher frequency of vitamin-D insufficiency. This prevalence can reach up to 83 percent, according to reports. The purpose of this study was to examine the effects of supplementation with vitamin D3, vitamin C, vitamin E, and zinc on pain and functional ability in patients with chronic low back pain.

Keywords: Vitamin D, zinc, supplementation, low back pain

Introduction

Pain is an unpleasant sensory and emotional experience that is related with existing or possible tissue damage, or that is characterised in terms of such damage [1]. Pain may be defined as an unpleasant sensory and emotional experience that is connected with existing or potential tissue damage. Back pain is the second most common sort of pain complaint, with headache being the most common type of pain complaint overall. It can be difficult to pinpoint the underlying cause of chronic low back pain (CLBP), which often results in symptoms that become progressively worse over time. Even though there are several pharmacological and invasive therapeutic options available, a substantial proportion of patients still have severe morbidity [2]. This is due to the fact that there is no cure for the condition. Vitamin D deficiency has been associated to many kinds of chronic musculoskeletal pain, including low back pain (LBP), which has also been connected to other types of LBP. In addition, a lack of vitamin D can harm the flexibility of the body in a way that is both direct and indirect owing to the impact that pain has on the body.

Patients who suffer from persistent low back pain have been observed to have a much greater frequency of vitamin-D insufficiency (up to 83%), as compared to the general population [2-5].

Concerning the processes that underpin these interactions, there is currently a dearth of knowledge [6, 7]. In theory, two distinct kinds of links may be established between the two things. In the first instance, it is possible that hypovitaminosis D is to blame for the broad soreness in the bones and muscles, in addition to the weakness and paresthesia. Second, hypovitaminosis D may play a part in the development of morphological changes by making the vertebral end plates more susceptible to the effects of irradiation [8]. Because of this greater sensitivity, morphological abnormalities could develop. Vitamin E is an essential component that the body uses as an antioxidant, making it one of the most vital nutrients. One of the important nutrients is vitamin E. It is the chain-breaking antioxidant with the largest significance in the body and the first line of defence against lipid peroxidation. It acts as a buffer against the harm that free radicals can bring to cell membranes [9]. The antinociceptive effects of vitamin E were seen and

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described in the very first stages of study. For instance, streptozotocin-induced diabetic neuropathy in rats was treated with the nutritional supplement vitamin E (12 g/kg per day, administered orally for three months), and this resulted in an improvement in the animals' nerve conduction impairments [10]. According to the findings of one study, rats that had undergone spinal nerve ligation saw a reduction in the severity of mechanical allodynia after receiving a single infusion of vitamin E (0.1-5 g/kg intraperitoneally).

Aims and Objectives

The effects of supplementing with vitamin D, vitamin C, vitamin E, and zinc in patients with persistent low back pain.

Materials and Methods

Both the SSPM Medical College and the lifetime Hospital Padve Sindhudurg participated in the research for this study. The research was carried out between October 2014 and October 2016, inclusive.

One hundred patients with chronic low back pain (CLBP) for at least three months, no leg pain, not responding to medications and physical therapies, having a pain score of at least 5 as assessed on a 0–10 Visual Analogue Scale (VAS) at baseline, and having low plasma levels of 25-hydroxyvitamin D3 (30 ng/mL) were eligible for study recruitment. Patients' ages ranged from 20–65 years old. Patients' pain scores ranged from at least 5 to at least 10. Patients who did not report having any discomfort in their legs were not included in the research. After a time of abstinence lasting for a full 24 hours, a blood sample was taken and examined to determine the levels of 25-hydroxyvitamin D3.

Before and after 8 weeks treatment protocol, McGill Pain Questionnaire, The Finger Floor Test, Roland Morris Disability Questionnaire, Fear-Avoidance Beliefs Questionnaire was evaluated.

Results

Table 1: Sex Distribution

Total	Male	Female
100	50	50

Table 2: Age Distribution

20-35 years	36-50 years	50-65 years
28.65±1.17 years	41.18±2.2 years	61.49±0.37 years

Table 3: Before treatment, MPQ, FFT, RMDQ and FABQ were evaluated and the results were recorded.

MPQ	51.38±5.48
FFT	5.64±1.35 cm
RMDQ	12.9±1.39
FABQ	2.9±0.23

Table 4: After treatment, MPQ, FFT, RMDQ and FABQ were evaluated and the results were recorded.

MPQ	21.38±4.94
FFT	2.38±0.36 cm
RMDQ	5.62±0.38
FABQ	2.35±5.4

Discussion

The activation of certain enzymes, such as proline hydroxylase and lysine hydroxylase, is essential to the preservation of stable collagen helixes, which are the defining characteristic of healthy connective tissues. Ascorbic acid is a common name for vitamin C, which is also an important component of vitamin C. It is common knowledge that vitamin C possesses the ability to act as an antioxidant. In this capacity, it shields DNA, proteins, and the cellular walls from the potentially harmful effects of oxidation. Antioxidant vitamins are essential to humans not only because of their preventive action against the damages caused by free radicals, but also because they contribute to regenerate the redox (oxidoreduction) potential of cells and circulating fluids, and to maintain a stable and active antioxidant system [12]. This is because antioxidant vitamins play a role in maintaining a stable and active antioxidant system. Because antioxidant vitamins play a part in keeping an antioxidant system stable and functioning, this is one reason why this is the case. Zinc is a trace element that has been shown to play a significant part in the maintenance of human health. It is necessary not only for the processes of cellular differentiation and production, but also for the synthesis of proteins and nucleic acids. In addition, it plays a key role in the generation of new cells. In addition to this, it participates as a microelement in a large number of different biological processes [13, 14]. Zinc is required for the normal functioning of about three hundred distinct metalloenzymes, in addition to the RNA enzymes and DNA polymerases that they

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are a component of. Zinc also plays an important role in the synthesis of proteins. In addition to this, there is evidence to suggest that zinc has a role in the normal operation of the immune system. Growth restriction, iron deficiency anaemia, organomegaly, insufficient wound healing, weight loss, impaired immune response, and increased susceptibility to infection can all be caused by a zinc deficiency [15-17]. Among the other symptoms is something called organomegaly. It has been demonstrated that zinc can alleviate gastrointestinal infections and diarrhoea, in addition to assisting in the healing of wounds by activating enzymes involved in the synthesis of collagen. These advantages may be traced back to zinc's presence in the body. The current study is being carried out with the intention of establishing the efficacy and safety of dietary supplements including vitamin D3, vitamin C, vitamin E, and zinc with reference to the alleviation of pain and other symptoms associated with CLBP.

Conclusion

It is important not to forget about the impact that vitamin D, vitamin C, vitamin E, and zinc have on chronic pain; these effects should be questioned throughout the examination.

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