

Is There a Link between Nonspecific Musculoskeletal Pain and Vitamin D Deficiency

Backgrounds: A lack of vitamin D is common everywhere, including Iran. Non-specific musculoskeletal pain has been linked to vitamin D deficiency, according to some research. The evaluation of the relationship between vitamin D deficiency and musculoskeletal pain as well as the patients' responses to vitamin D supplementation is the goal of this study.

Materials and Methods: The study included 62 adult patients with musculoskeletal pain as their primary complaint. 25(OH)D, calcium, phosphate, alkaline phosphatase, and PTH were measured in the blood. Vitamin D was taken orally if there was a vitamin D deficiency. The Visual Assessment Score (VAS) was used to evaluate pain and its response to therapy. For statistical analyses, version 15.0 of the SPSS software was used.

Conclusion: The majority of patients with vitamin D deficiency can experience pain relief with vitamin D treatment. Serum vitamin D concentration may not have sufficiently increased for the patient to respond. This problem could be brought on by noncompliance, physiological differences in body mass index, and differences in gastrointestinal vitamin D absorption. In patients who do not respond, it is recommended to reevaluate the concentration of 25(OH) D in the serum.

Keywords: Vitamin D deficiency • Musculoskeletal pain • Vitamin D supplementation • Iran

Introduction

Lack of vitamin D is normal overall particularly in Asian nations. Recent research has shown that it even occurs frequently in countries with abundant sunshine. Recent studies indicate that between 66 and 83% of Iranians lack vitamin D [1]. Vitamin D deficiency reduces GI calcium absorption. Osteoclast activity rises in tandem with an increase in parathyroid hormone secretion. The end results are osteoporosis, osteomalacia, and osteopenia. Osteomalacia can result from prolonged and persistent vitamin D deficiency; additionally, a mild vitamin D deficiency may cause a variety of musculoskeletal pains, including arthralgia, low back pain, and fibromyalgia-like pain. In the United States, 89% of adults suffer from altered quality of life and short- or long-term disabilities, and between 9% and 20% of adults complain of chronic pain. The condition has annual costs of up to 50 million dollars, both direct and indirect [2]. Only 25% of patients with chronic pain have a specific source of their pain; for others, unidentified idiopathic

etiologist should be taken into consideration. Non-specific musculoskeletal pain, including low back pain, has been linked in some studies to vitamin D deficiency. The purpose of the current study was to assess both the clinical response of vitamin D deficient patients to vitamin D supplements and the frequency with which patients with chronic musculoskeletal pain suffer from vitamin D deficiency [3]. The respondent and non-respondent patients' clinical and laboratory data were compared.

Materials and Methods

The current descriptive analytic study was carried out in the referral teaching hospital Buali hospital in the Iranian city of Qazvin [4-5]. The study included 65 adult participants. Their primary complaint of musculoskeletal pain had been referred to a rheumatology outpatient clinic for more than two months. Patients with any rheumatologic diseases, intervertebral disk diseases, anatomic skeletal malformations, renal disorders, cirrhosis, malabsorption syndrome, and drug history

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of vitamin D supplements, anticonvulsants, and anti-TB medications were excluded from the study. If they were taking calcium or multivitamin supplements, their preparations had to be stopped for two weeks before the start of the study. Serum tests were taken from the patients for evaluation of 25(OH) D, Calcium, Phosphate, Basic Phosphatase, and PTH focuses. Using a commercial kit from Zist shimi, Iran, the calcium level was measured by calorimetry [6]. ELISA reader awareness and a commercial kit from Euroimmun, Germany, were used to measure serum vitamin D. For (OH) D, the intra- and inter-assay values were 3.3% and 6.7%, respectively. In the event that the patients lacked vitamin D, they received 1000 mg/day elemental calcium and 50000 units of vitamin D₃ taken orally for weeks. They were given a second assessment to see how their pain responded to the treatment three months later. The Visual Assessment Score (VAS) was used to determine the degree of pain before and after treatment. In patients who responded to the treatment and those who did not, serum concentrations of (OH) D, calcium, phosphate, alkaline phosphatase, and PTH were compared. Quantitative parameters with normal and abnormal distributions were compared using the T-test and Mann-Whitney, respectively. The relative frequencies were compared using the chi-square test [7]. For statistical analyses, version 15.0 of the SPSS software was used. A difference was deemed significant when its P value was less than 0.05.

Discussion

Numerous researchers have focused on the link between vitamin D deficiency and musculoskeletal pain. 150 people with musculoskeletal pain were studied by Gregory and his co-workers [8-9]. They demonstrated that 93% of them lacked vitamin D deficiency was found in 63.4% of 276 patients with musculoskeletal pain in Iran. Similar studies have found an association between the aforementioned variables; however, a small number of studies have found no link between vitamin D deficiency and pain in the musculoskeletal system. Vitamin D is fundamental for GI retention of calcium. A lack of vitamin D causes an increase in the production

of parathyroid hormone (PTH), which in turn increases the activity of osteoclasts in the bone. With decreased calcium absorption from the gastrointestinal tract, the phosphatauric property of PTH may reduce the calcium-phosphate interaction and, as a result, bone mineralization. Osteoclast and osteoblast activity raises the amount of bone matrix with low mineralization. Water would be taken in by the resulting matrix; As a result, the sub periosteal space dries up. Bone pain may result from the event. The current study demonstrated that taking vitamin D supplements can alleviate pain in the majority of patients. The respondent group had a 2.5-fold greater mean rise in serum (OH) D concentrations than the non-respondent group. Additionally, Ryan has reported varying increases in serum (OH) D concentrations following supplementation with vitamin D. It has been hypothesized that the degree of an increase in serum (OH) D concentration following vitamin D supplementation is determined by BMI (body mass index); however, in the current study, the patient's age was comparable between the two groups. Investigation of Ryan has found no relationship between age of the patients and degree of ascend in serum (OH) D cholecalciferol fixation [10]. Weight record and unfortunate consistence are different elements which can impact serum vitamin D level after treatment of lack of vitamin D. The findings of this study emphasize the need for repeated serum vitamin D measurements in patients with vitamin D deficiency and musculoskeletal pain whose pain does not respond to oral vitamin D supplementation, regardless of the cause of some patients' inadequate response to treatment. If a low serum vitamin D level is found in these situations, vitamin D supplementation is necessary. The discomfort caused by vitamin D deficiency has been attributed to a particular character, according to some authors. They think that the pain is typically felt in the muscle or bone. In the current study, bone and muscle pains were reported by 93.5 percent and 12.9% of patients, respectively. Additionally, bone tenderness at the sternum, tibia, radius, or ulna is thought to be a common symptom of vitamin D deficiency. In this study, 66.1% of patients experienced bone tenderness, typically in the lower limbs.

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