Original Article

Vitamin D deficiency in Fibromyalgia

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Abstract

Objective: To check the Vitamin D levels in patients diagnosed as fibromyagia in our population.

Methods: Study was done at Medical OPD of Civil Hospital Karachi, from January to March 2009. Female patients diagnosed as Fibromyalgia according to American College of Rheumatology (ACR) criteria and exclusion of systemic illness on examination, and normal reports of blood CP, ESR, serum calcium, phosphate and Alkaline Phosphatase, were asked to get Vitamin D levels in their serum. Vitamin D deficiency is defined as < 20 ng/ml, Vitamin D insufficiency 21-29 ng/ml and Vitamin D sufficiency equal or > 30 ng/ml.

Result: Forty female patients were included in the study. The mean age was 37.65 ± 11.5 years. Mean Vitamin D level was 17.41 ± 5.497 ng/ml. Thirty two (80%) of patients had Vitamin D deficiency, mean levels of 15.855 ± 4.918 ng/ml and 8(20%) had Vitamin D insufficiency, mean levels of 23.64 ± 2.39 ng/ml. Patients with vitamin D deficiency and age less than 45 years were 22 (68.75%), had mean vitamin D level 16.87 ± 4.48 ng/ml whereas in age ranging from 46-75 years were 10 (31.25%) had mean vitamin D level 16.09 ± 6.45 ng/ml.

Conclusion: Vitamin D deficiency is frequently seen in patients diagnosed as fibromyalgia and nonspecific musculoskeletal pain in our population. Although the sample size of the study is small, but the figures are so alarming that it is an eye opener towards the need of a population based study, including normal population as well as those presenting with musculoskeletal pain (JPMA 60:949; 2010).

Introduction

Fibromyalgia is a chronic, widespread myalgia that by definition involves the body above and below the waist, and to the right and left sides of midline, such that three or four quarter of the body are involved. According to American college of Rheumatology definition of fibromyalgia for research study requires that, symptoms have been present for at least three months and eleven sites of a specified eighteen sites be tender.[1] Fibromyalgia is above all a chronic muscular pain, but is associated with a number of other symptoms that include sleep disturbance and fatigue, headache, morning stiffness, irritable bowel syndrome, interstitial cystitis, dyspareunia and mood disturbance.[2]

Studies of fibromyalgia and persistent non specific musculoskeletal pain have found that a low level of vitamin D is common.[3] Vitamin D is an important immune system regulator.[4] It has been identified as a significant factor for incidence of several autoimmune illnesses such as Multiple sclerosis, Rheumatoid arthritis, Insulin dependent Diabetes Mellitus and inflammatory bowel disease.[5] There is no consensus on optimal levels of 25-Hydroxy Vitamin D as measured in serum. Vitamin D deficiency is defined by most experts as 25 -Hydroxy Vitamin D level less then 20 ng /ml (50nmol/ml).[6,7] With the use of such definitions, it has been estimated that one billion people worldwide have Vitamin D deficiency or insufficiency.[8] Vitamin D deficiency is common when most of the skin is shielded from sun. In studies in Saudi Arabia, the United Arab Emirates, Australia, Turkey, India and Lebanon, 30-50% of children and adults had 25 Hydroxy Vitamin D levels under 20 ng/ml.[9,10]

As Vitamin D plays an important role in nonspecific musculoskeletal pain and fibromyalgia, and it has also been described in previouis studies that fibromyalgia patients were found to have vitamin D deficiency.[3] The aim of this study was to determine the Vitamin D levels in patients with fibromyalgia in our population and whether this deficiency also prevails in our patients.

Patients and Methods

Female patients diagnosed as Fibromyalgia according to ACR criteria and exclusion of systemic illness on examination, and normal blood CP, ESR, serum calcium, phosphate and Alkaline Phosphatase were included for the study. In fasting state 5ml blood was drawn after aseptic measures. The serum 25-OHD concentrations were measured by Electrochemiluminescence method from Aga Khan University Lab. The reference range for 25-OHD was = or > 30 ng/ml as normal, vitamin D deficiency was defined as serum 25-OHD levels < 20 ng/ml while a level between 20.1-20.9 ng/ml was defined as insufficiency.

Result

Forty female patients were included in the study. The mean age was 37.65± 11.5 years. Mean Vitamin D level was 17.41 ± 5.497 ng/ml. Thirtytwo (80%) patients had Vitamin D deficiency, mean levels of 15.855± 4.918 ng/ml and 8(20%) had Vitamin D insufficiency, mean levels of 23.64 ± 2.39 ng/ml. Patients with vitamin D deficiency and age less than 45 years were 22 (68.75%), had mean vitamin D level 16.87 ± 4.48 ng/ml whereas in age ranging from 46-75 years were 10 (31.25%) had mean vitamin D level 16.09 ± 6.45 ng/ml. The relation of age to vitamin D levels is shown in Table.

Table: Relation of age to vitamin D levels.

Age in years	Mean vitamin D levels (ng/ml)	Number of patients n = 40	P value
15-30	19.357 ± 2.142	13(32.5%)	0.294
31-45	16.782 ± 6.478	15 (37.5%)	
46-55	15.300 ± 6.845	10 (25%)	
56-70	20.080 ± .0000	2 (5%)	

Discussion

Fibromyalgia is a complex problem in which symptoms of anxiety and depression features prominently and low levels of Vitamin D have been frequently reported.[11] According to Plotnikoff GA et al, one fifty patients presented with persistent nonspecific musculoskeletal pain, all were high risk for the consequences of unrecognized and untreated hypovitaminosis D.[12] Vitamin D regulates the functions of over 200 genes and is essential for growth and development of the body. Vitamin D deficiency is prevalent throughout the world, but appears to be worse in countries of sunny South Asia, especially among children, women and elderly. Poor diet, cultural practices of the region and poverty are some of the important reasons for vitamin D deficiency. Hypovitaminosis D is considered responsible for rickets, birth defects, osteomalacia, osteoporosis, osteoarthritis, chronic pain and muscle pain. Recent research has associated vitamin D deficiency as a contributing factor in diseases such as heart disease, hypertension, neurological diseases, autoimmune disease, depression and cancer.[13]

Vitamin D deficiency is now recognized as a panendemic. The major cause of vitamin D deficiency is the lack of appreciation that sun exposure in moderation is the major source of vitamin D for humans. Very few foods naturally contain vitamin D and foods that are often fortified with vitamin D are often inadequate to satisfy either a child's or an adult's vitamin D requirement.[14,15] Vitamin D inadequacy is associated with medication refractory musculoskeletal pain, a neuromuscular dysfunction. This vitamin deficiency could sublist as an unrecognized comorbid condition among patients with chronic pain.[16]

In our patients of fibromyalgia 32 (80%) had vitamin D deficiency and 8 (20%) had vitamin D insufficiency. According to Plotnikoff GA etal 93% of subjects had deficient levels of vitamin D, twenty eight percent of subjects were labeled as having severe deficiencies.[12] Published work on vitamin D suggests that patients with nonspecific musculoskeletal pain should have their serum vitamin D levels measured. He cautions that physician should ignore the lab reported lower limit of normal range and that a serum vitamin D level of at least 20 ng/ml is necessary to minimally satisfy the body's vitamin D requirement. However, a mantainance serum level of 30-50 ng/ml is more desirable. The study also states that vitamin D deficiency can be treated easily by giving the patient oral dose of 50,000 IU of vitamin D once a week for eight weeks.[17]

Most of the patients were of age less than 45 years, had severe deficiency of vitamin D. Zuberi et al also found much younger patients than any previously reported in populations at risk of vitamin D deficiency.[18] Similarly in Plotnikoff's study on 150 patients, 55% were younger than 30 years of age.[12] Fifty two percent of Hispanic and black adolescents in a study in Boston and 48% of white preadolescent girls in a study in Maine had vitamin D 3 levels below 20 ng/ml.[19,20] Study conducted in male university students in Riyadh found the percentage of subjects with serum 25 hydroxy vitamin D levels below 10 ng/ml, in 35,45,53 and 50% for normal Saudis, Jordanians, Egyptians and others respectively. All subjects had normal serum calcium concentration despite abundant sunlight all the year round.[10] These data on serum vitamin D levels in young people raise some concern about their food choices and even the amount of time they spend in the sunshine. Marwala et al assessed the calcium ,vitamin D Paratharmone axis in apparently healthy children from two different socioeconomic backgrounds in New Dehli, and found concentration of 25(OH)D < 9 ng/ml in 37.5% children. They concluded that a high prevalence of clinical and biochemical hypovitaminosis D exists in apparently healthy school children in Northern India.[9]

Vitamin D deficiency and osteomalacia should be considered in the differential diagnosis of patients with musculoskeletal pain, fibromyalgia, chronic fatigue or myositis. There is a need for both education of health professional and the general public regarding the optimization of vitamin D status in the care of rehabilitating patients.[21] Aging, increased skin pigmentation and obesity are associated with vitamin D

deficiency. The level of 7 dehydrocholesterol in the skin decline with age. Sunscreen are effective at preventing sunburning and skin damage, because they efficiently absorb solar UVB radiation when used properly, a sunscreen with a sun protection factor of 8 reduces the capacity of the skin to produce cholecalciferol by 95%. Melanin is an extremely effective UVB sunscreen.[22]

As vitamin D deficiency is so common throughout the world as well as in our population, there is need to fulfill our requirements by regular supplementation as well as fortification of different food products.

Conclusion

Vitamin D Deficiency is frequently seen in patients diagnosed as fibromyalgia and nonspecific musculoskeletal pain in our population. Although the sample size of the study is small, but the figures are so alarming that it is an eye opener towards the need of a population based study , including normal population as well as those presenting with musculoskeletal pain. There is also a need to look into the factors contributing to vitamin D deficiency in our younger population as now it is not only considered as a culprit to bone disease but also common diseases like Diabetes, Hypertension and Heart disease which is already a burden on our health projects. More studies are needed to see the optimum levels of vitamin D in our population to prevent the different health consequences.

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