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Vitamin d status, associated occupational factors and the response to vitamin d therapy at 3 month followup: A study based on Kashmiri population presenting with nonspecific musculoskeletal symptoms in a tertiary care centre

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Abstract

Vitamin D also known as sunshine hormone plays a vital role in calcium homeostasis, cell proliferation and differentiation, regulation of immune system and integrity of neuromuscular system. This study was done to know the occupational relationship of vitamin D Levels in patients presenting to our hospital with multiple symptoms and response to vitamin D supplement at three month follow up. A total of 938 patients with nonspecific musculoskeletal complaints were included in our interventional study (March 2019-january 2020). Housewife females, chair bound office workers and students were the majority of patients with vitamin D deficiency or insufficiency as reported in our study. Sixty four percent (64%) patients at the final followup responded to vitamin D treatment.

Keywords: Vitamin D, occupation, deficiency, insufficiency, musculoskeletal

Introduction

Vitamin D is a major steroid hormone involved in mineral ion homeostasis regulation. The biological effects of vitamin D are mediated by vitamin D receptors, found in most tissues thus potentially expanding vitamin D actions on nearly all cell systems and organs. A major source of vitamin D is its synthesis in the skin up on ultraviolet B exposure. Except for fish, food (unless fortified) contains only limited amount of vitamin D. Regardless of the cause clinical manifestations of vitamin D deficiency are largely a consequence of impaired intestinal calcium absorption. A systematic review of 71 studies from across the globe showed that occupation is a major Factor contributing to sub-optimal vitamin D levels, and indoor workers are at a greater risk compared to outdoor workers; more than three-fourths (78%) of indoor workers were found to be vitamin D deficient compared to less than half (48%) of outdoor workers. Indoor workers spend a significant amount of time working indoors without sunshine exposure. Furthermore, due to the conventional Working time of indoor workers, they are exposed to sunlight mostly during mornings and evenings, the intensity of UV-B exposure is relatively low. Sunlight deprivation among indoor worker sputs them at high risk of developing vitamin D deficiency and its associated health risks. Our study assessed vitamin D levels in 938 patients with different occupations and presenting symptoms and grouped them as vitamin D deficient or vitamin D insufficient. 527 out of 938 patients had vitamin D levels less than 30 ng/ml, they received vitamin D supplement for three months and were assessed at 3 month follow up.

Materials and methods

This study was conducted at Bone and joint surgery hospital Srinagar an associated hospital of Government medical college srinager from March 2019 to January 2020.

All the patients who presented with nonspecific musculoskeletal symptoms were included in the study. Their occupation was properly documented and the blood samples were taken for vit. D level assessment after proper consent. Patients with vitamin D levels less than 30ng/ml

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were classified as insufficient level and vitamin D levels less than 20ng/ml were classified as deficient level. Patients with levels <30ng/ml received vitamin D supplement and response was assessed at three month followup. Patients with lower than normal levels of vitamin D received oral administration of 50,000IU/week for 8weeks and were assessed at three months with advices to follow the maintenance doses. Screening test used: serum 25(OH) D levels.

Aims and Objectives

- To find the prevalence of vitamin- D deficiency in patients coming to Orthopaedic OPD with nonspecific musculoskeletal complaints and their occupational relationship.
- To evaluate the effect of vitamin D supplementation in relieving such symptoms.

Observations and Results

Total number of patients: 938.

Males: 340 (36.2%)

Females: 598 (63.8%)

Age range (20-60) with mean age 46.3 years.

Occupational status

Housewife... 540

Household and internal labourer...300

Shopkeeper and office workers (chair bound, clerk, sweeper) 34

Student... 44

Teacher.....10

Business (field) 10

Clinical presentation

Polyarthralgias... .. 300

Nonspecific lower back pain.....270

Neck and periscapular pain..... 150

Thigh or calf pain... .. 72

Pain knee and /or ankle..... 50

Rib pain and discomfort..... 46

Elbow and forearm pain... .. 32

Fatigue and muscle cramps..... 18

In all 938 patients with nonspecific musculoskeletal symptoms, vitamin D levels were assessed.

Out of 938 patients 527 patients had vitamin D levels less than 30ng/ml. Levels between 20-30ng/ml were classified insufficient and those below 20ng/ml as deficient.

Insufficient levels in: 210

Deficient levels in: 317

Out of 527 patients with low vitamin D levels the occupational status was:

Housewife..... 330

Household labourer, mine worker, internal workers..... 152

Students.30

Business... .. 6

Teacher..... 4

Thus most of the patients with nonspecific musculoskeletal symptoms and documented vitamin D low levels were the house hold workers, office workers, underground workers with inadequate exposure to sunlight.

All the 527 patients were put on vitamin D supplements for 8weeks and followed after three months and assessed for regression of symptoms.

273 patients lost to follow up and the final follow up was

done for 244 patients.

Out of 244 at final follow up, 168 (108 deficient and 60 insufficient) patients responded to vitamin D therapy and 76 showed persistent symptoms with no response to vitamin D therapy. Among 168 patients who responded to vit. D, 152 had vit. D levels in normal range at the final follow up, and 16 still had insufficient levels.

Conclusion

Patients reporting with nonspecific musculoskeletal complaints and then documented lower levels of vitamin D are mostly the house hold workers, housewives, chair bound employees with inadequate exposure to sunlight.

168 out of 244{64%} patients at the final follow up responded well. Patients with non specific musculoskeletal symptoms reporting to out patient department should be subjected to serum vitamin D level estimation and if levels on lower side should be supplemented with vitamin D as it is observed that there is improvement of symptoms in patients with vitamin D supplementation for a period of eight weeks.

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