

A Prospective Study of Assessment of Vitamin D Levels in Patients At a Tertiary Care Teaching Hospital

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ABSTRACT

Introduction: To manage nonspecific musculoskeletal pain, vitamin D supplementation may enhance muscle strength and thus, may also be an easy and inexpensive way to manage nonspecific chronic recurrent musculoskeletal pain. In view of this present study was undertaken to evaluate Vitamin D in patients with nonspecific chronic recurrent musculoskeletal pain.

Materials and Methods: The present cross-sectional study was carried out among patients with persistent, nonspecific chronic recurrent musculoskeletal pain over a period of 1 year was enrolled for the study. Blood samples were taken and serum 25-hydroxyvitamin D levels were determined. Patients with serum 25-hydroxyvitamin D level of 20 ng/mL or less were considered as vitamin D deficiency and patients with 25-hydroxyvitamin D level of 21 to 32 Ng/mL was considered as cases of vitamin D insufficiency. Data so obtained was compiled and analyzed using SPSS-16. Descriptive statistics were calculated.

Results: Vitamin D deficiency (<30 ng/ml) was present in 28 patients; 42 patients had vitamin D level <20 ng/ml and 30 patients had sufficient levels of vitamin D. Among the patients suffering from musculoskeletal pain and having level of vitamin D<20 ng/mL were 3 bankers, 4 teachers by profession, 2 computer operators, 6 were doing other inside office jobs, 4

were shopkeepers, 1 was nurse, 1 was doctor, 4 were dentist, 3 were housewives and 5 were retired persons.

Conclusion: Due to high prevalence of jobs inside offices, there is high incidence of vitamin D deficiency among patients with chronic musculoskeletal pain. The present study emphasis that patients with nonspecific musculoskeletal should be evaluated for serum 25-hydroxyvitamin D to prevent delay of diagnosis.

Keywords: Hypovitaminosis; Musculoskeletal Pain; Vitamin D.

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INTRODUCTION

Vitamin D is a secosteroid which is converted into its active form via 1 α -hydroxylase enzyme. Though kidney is the classical site for 1 α -hydroxylase activity, it is also expressed in other tissues such as endothelial and vascular smooth muscle cells. Besides, vitamin D receptor (VDR) is present in more than 30 different tissues including pancreas, myocardium, lymphocytes, etc. The widespread distribution of VDR signifies important role of vitamin D in humans.¹

Vitamin D deficiency in adults eventually leads to the osteomalacia syndrome, with its characteristic clinical features of bone pain, muscle weakness, and difficulty in walking.² Vitamin D insufficiency is associated with an increased risk of fracture due to both proximal weakness leading to increased body sway with a propensity to fall and to skeletal fragility from secondary hyperparathyroidism (increased bone turnover and decreased bone density), or from the development of osteomalacia.³

To manage nonspecific musculoskeletal pain, vitamin D supplementation may enhance muscle strength and thus, may also be an easy and inexpensive way to manage nonspecific chronic recurrent musculoskeletal pain.⁴ In view of this present study was undertaken to evaluate Vitamin D in patients with nonspecific chronic recurrent musculoskeletal pain.

MATERIALS AND METHODS

The present cross-sectional study was carried out among 100 patients aged 30 to 70 years reporting to Department of Orthopaedics, Dr. B. R. Ambedkar Medical College, Bengaluru, Karnataka (India) with complaint of musculoskeletal pain. 100 patients with persistent, nonspecific chronic recurrent musculoskeletal pain over a period of 1 year were enrolled for the study. Informed consent was taken from the patients. Patients with any liver or kidney disorders were excluded from the study.

History of musculoskeletal pain and the other demographic variables were noted using pretested proforma. All patients were evaluated for Vitamin D level. Blood samples were taken and serum 25-hydroxyvitamin D levels were determined by radioimmunoassay method. Patients with serum 25-hydroxyvitamin D level of 20 ng/mL or less were considered as vitamin D deficiency and patients with 25-hydroxyvitamin D level of 21 to 32 Ng/mL was considered as cases of vitamin D insufficiency.⁵ Data so obtained was compiled and analyzed using SPSS-16. Descriptive statistics were calculated.

RESULTS

Vitamin D deficiency (<30 ng/ml) was present in 28 patients; 42 patients had vitamin D level <20 ng/ml and 30 patients had sufficient levels of vitamin D (Table 1 and graph 1).

Table 2 shows distribution of patients according to the profession. Among the patients suffering from musculoskeletal pain and having level of vitamin D<20 ng/mL were 3 bankers, 4 teachers by profession, 2 computer operators, 6 were doing other inside office jobs, 4 were shopkeepers, 1 was nurse, 1 was doctor, 4 were dentist, 3 were housewives and 5 were retired persons.

Table 1: Distribution of patients according to the serum 25-hydroxyvitamin D levels

According to the serum 25-hydroxyvitamin D levels	No. of patients
Vitamin D deficiency	28
Vitamin D insufficiency	42
Vitamin D sufficiency	30

Graph 1: Distribution of patients according to the serum 25-hydroxyvitamin D levels

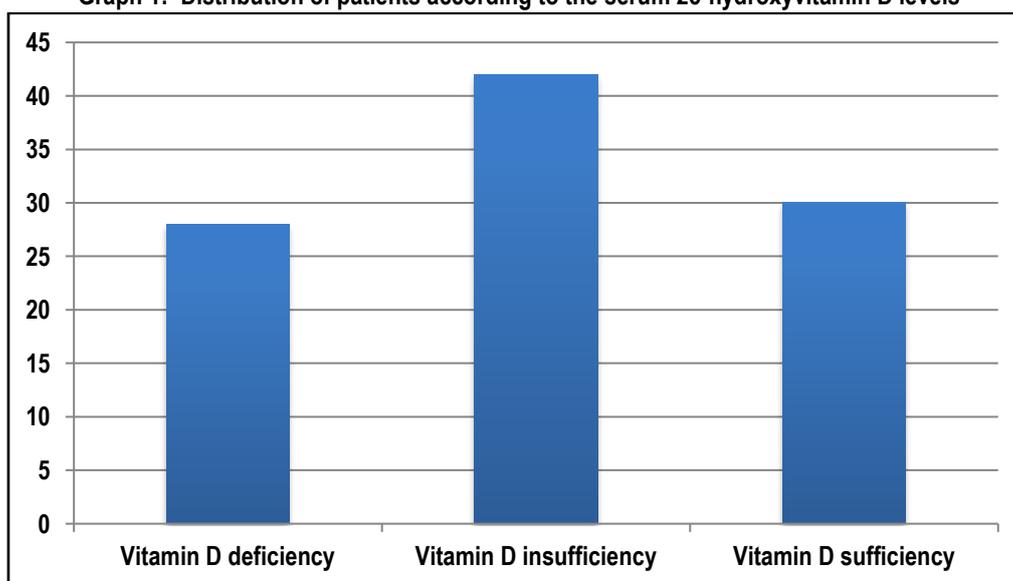


Table 2: Distribution of patients according to the profession

Occupation	Vitamin D insufficiency (n=42)	Vitamin D deficiency (n= 28)
Bankers	5	3
Teachers	4	4
Computer operators	4	2
Other inside office service	5	6
Shopkeepers	4	4
Nurses	3	1
Doctor	2	1
Dentist	5	4
Housewives	4	3
Retired	6	5
Total	42	28

DISCUSSION

The present study found that Vitamin D deficiency (<30 ng/ml) was present in 28 patients; 42 patients had vitamin D level <20 ng/ml and 30 patients had sufficient levels of vitamin D. Harinarayan CV et al⁶ studied the concentrations of serum 25-hydroxyvitamin D [25(OH)D] among Indian urban and rural populations and reported that 25(OH)D concentrations were found

deficient in 44% of the studied men and 70% of the studied women among rural population and among 62% men and 75% women among urban population. Steele B et al⁷ carried a study to study to test the hypothesis that vitamin D insufficiency is comparably prevalent among both high and lowenergy fracture patients and reported that more women (75%) than men (40%) were vitamin D insufficient among all fracture patients.

Shatrugna V et al⁸ studied prevalence of osteoporosis in 289 middle aged women from Hyderabad. The prevalence of osteoporosis at the femoral neck was around 29 per cent. The T scores in the BMD of Indian women studied at all the skeletal sites were much lower than the values reported from the developed countries. BMD showed a decline after the age of 35 yr at lumbar spine and femoral neck. On multiple regression analysis, calcium intake of women appeared as an important determinant of BMD. However, 25 (OH) D status was not assessed in the study. Plotnikoff GA et al⁹ determined the prevalence of hypovitaminosis D in primary care outpatients with persistent, nonspecific musculoskeletal pain syndromes refractory to standard therapies and reported that all patients with persistent, nonspecific musculoskeletal pain are at high risk for the consequences of unrecognized and untreated severe hypovitaminosis D. Marwaha RK et al¹⁰ conducted a study among Delhi school children (10-18 years of age) and reported that over one third had 25(OH)D values <9 ng/mL (<22.5 nmol/L) with the prevalence being higher in those children from low socio-economic backgrounds and in females. Sachan A et al¹¹ determined the prevalence of osteomalacia and hypovitaminosis D in pregnancy and in cord blood and to correlate maternal 25-hydroxyvitamin D [25(OH)D] status with sun exposure, daily calcium intake (dietary plus supplemental), and intact parathyroid hormone (PTH) concentrations. Mean maternal serum 25(OH)D was 14 +/- 9.3 ng/mL, and cord blood 25(OH)D was 8.4 +/- 5.7 ng/mL. Eighty-four percent of women (84.3% of urban and 83.6% of rural women) had 25(OH)D values below that cutoff and the study observed a high prevalence of physiologically significant hypovitaminosis D among pregnant women and their newborns, the magnitude of which warrants public health intervention.

CONCLUSION

Due to high prevalence of jobs inside offices, there is high incidence of vitamin D deficiency among patients with chronic musculoskeletal pain. The present study emphasizes that patients with nonspecific musculoskeletal should be evaluated for serum 25-hydroxyvitamin D to prevent delay of diagnosis.

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