

Evaluation of Vitamin D Levels in Patients Presenting Nonspecific Musculoskeletal Pain at a Tertiary Care Hospital: A Cross Sectional Study

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Abstract

Original Research Article

Introduction: Vitamin D insufficiency affects nearly 50% of the population worldwide. Vitamin D deficiency involves the musculoskeletal system leading to proximal muscle weakness, bone pain, and osteomalacia which is largely unrecognized by both physicians and patients. The early detection of deficiency plays an important role to prevent those diseases. The aim of the study is to find to evaluate the association of chronic low back pain with levels of vitamin D in the affected population. **Methods:** This observational study was carried out from January 2021 to December 2021 at a tertiary care hospital. Patients aged 18 years and above presenting with non-specific complaints of general body pain/back pain/tiredness/weakness on working and walking with no other symptoms such as injury or known medical illness and no relief of the pain symptoms with routine treatments with analgesics and rest and physiotherapy were screened for Vitamin D levels. **Results:** Out of 580 patients tested, 478 (82.4%) of the study population had below-normal vitamin D, of the 49.1% had deficiency, 33.3% had insufficiency and 17.5% had sufficient vitamin D level. The proportion of patients with Vitamin D deficiency is higher in the age group 30-59 whereas insufficiency was higher in the age group 20-39 compared to other age groups and it was found statistically significant. **Conclusion:** Importance has to be given to adequate vitamin D supplementation in the patients with vitamin D deficiency.

Keywords: Low back pain, non-specific pain, Vitamin D.

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INTRODUCTION

Vitamin D deficiency is recognized as a major public health problem in the world. Vitamin D maintains calcium homeostasis of bone. Low concentrations of vitamin D lead to alterations in calcium and phosphorus homeostasis and result in osteoporosis [1]. The deficiency is due to inadequate exposure to the sun and lack of vitamin D rich diet. It is associated with risk of autoimmune diseases, hypertension, and infectious diseases [2].

Serum 25OHD is the most reliable indicator of the vitamin D status of an individual. Serum 25OHD levels less than 20 ng/mL is considered as "deficiency", the levels between 20 ng/mL and 30 ng/mL considered

as insufficiency and levels greater than 30 ng/mL is considered as "normal". Vitamin D deficiency is a highly prevalent condition in the developed world and in the populous regions of Asia, the Middle East and India with a low serum 25(OH) D especially in women [3].

The skeletal and extra skeletal health benefits of vitamin D and the high prevalence of inadequate levels of vitamin D have been largely unrecognized by both physicians and patients [4]. Vitamin D deficiency involves the musculoskeletal system leading to proximal muscle weakness, bone pain, and osteomalacia [5].

The present study was undertaken with the objective of determining the prevalence of vitamin D

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(<20ng/dl) deficiency among patients attending the orthopedic outpatient department in tertiary care hospital with complaints of non-specific symptoms of body pain and low back pain without any other co morbid condition.

METHODOLOGY

A cross sectional study was conducted among 580 adult patients attending orthopedic department of SMBT Institute of Medical sciences and research Centre Nasik a tertiary care hospital. This study was carried out from January 2021 to December 2021.

Inclusion Criteria; Adult patients above the age of 18 years Patients presenting with non-specific complaints of general body pain/back pain/tiredness/weakness on working and walking with no other symptoms such as injury and known medical illness.

Exclusion criteria: Patients below the age of 18 years are excluded from the study and Adult patients above the age of 18 years with symptoms such as injury, fever, GIT problems, or known medical illness. Procedure: Patients are screened for Vitamin D levels when other routine tests such as complete blood count, ESR, BI, sugar, RFT were normal. The vitamin levels were tested in certified lab and Vitamin D Total test is analyzed. Based on the results the patients were classified into

deficiency with Vitamin D level (25-OH VITAMIN D) of <20 ng/ml, insufficiency with the levels of 20-30 ng/ml, sufficiency with the level of >30 ng/ml and toxicity with level of >100 ng/ml according to recent consensus.^{6,7,8}

Statistical analysis: The recorded data was compiled and entered into a spreadsheet computer program (Microsoft Excel 2007) and then exported to the data editor page of SPSS version 20 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistics included computation of percentages, means, and standard deviations.

RESULTS

Out of 580 patients above the age of 18 years who have attended orthopedic outpatient department with complaints of bone pain and myalgia with no joint pain were included in the study and screened for the level of vitamin D. The mean value of Vitamin D among males was 25.14 ng/mL and in females, the mean value is 24.86 ng/mL.

In the population studied 231 (39.8%) were males and 349 (60.2%) were females. The mean age of the participants was 48.28 (\pm 12.47) years and for male, it was 49.86 (\pm 14.72) years and females it was 44.36 (\pm 15.17) years. The majority of them i.e., 44.3% were in the age group above 40-59 years followed by 33.2% in 20-39 years age group.

Table 1: Age and sex distribution of the study participants

Age Distribution	Male (%)	Female (%)	Total (%)
20-39	80 (34.6)	111 (31.80)	191 (32.9)
40-59	100 (43.2)	159 (45.5)	259 (44.6)
60 and Above	51 (22.2)	79 (22.7)	130 (22.5)
Total	231 (100)	349 (100)	580 (100)

The vitamin D levels tested in patients, 478 (82.4%) of the study population had below-normal

vitamin D, of the 48.3% had deficiency, 34.25% had insufficiency and 17.7% had sufficient vitamin D level.

Table 2: Sex distribution and Vitamin D level of the study participants

Level of Vitamin D (ng/mL)	Male (%)	Female (%)	Total (%)
<20 (Deficiency)	102 (44.1)	183 (52.5)	285 (49.1)
20-30 (Insufficiency)	89 (38.7)	104 (29.8)	193 (33.4)
>30 (Sufficiency)	40 (17.2)	62 (17.7)	102 (17.5)
Total	231 (100)	349 (100)	580 (100)

The age distribution and vitamin D levels among the patients attending the orthopedic outpatient department. The proportion of patients Vitamin D deficiency is higher in the 30-49 group whereas

insufficiency was higher in the age group 20-39 compared to other age groups and it was found statically significant.

Table 3: Age distribution and Vitamin D level of the study participants.

Age Distribution/ Vit D Level	20-39 Years (%)	40-59 Years (%)	60 and Above (%)	Total (%)
<20 (Deficiency)	87 (45.5)	144 (55.7)	54 (41.5)	285 (49.1)
20-30 (Insufficiency)	67 (35)	79 (30.7)	47 (35.8)	193 (33.4)
>30 (Sufficiency)	37 (19.5)	35 (13.4)	30 (22.6)	102 (17.5)

Total	191 (32.9)	258 (44.4)	131 (22.6)	580 (100)
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DISCUSSION

In our study, the prevalence of vitamin D deficiency among adult patients attending the orthopedic department of a tertiary care hospital with non-specific complaints of general body pain/back pain/tiredness/weakness on working was 41.9% with 44% among males and 52.5% among females but other investigators such as Babita Ghai *et al.*, [9] reported 66% of the men and 73% of the women found to be deficient levels of Vitamin D.

Halim Yilmaz *et al.*, [10] reported 79.8% of the premenopausal women showed vitamin deficiency. Chittari V Harinarayan *et al.*, [11] reported 44% of men and 70% of women in rural areas and 62% of men and 75% women in urban areas had deficient vitamin D and reported 25 (OH) D levels in South Indian subjects are relatively higher compared with the subjects from North India.

In our study, the mean values of vitamin D were insufficiency between 20-30 ng/ml across the age and sex similar findings reported by Natasja M [3] and Ritu *et al.*, [6] of low serum level of vitamin D was noted especially among women.

David Arvold *et al.*, [12] reported the mean values of 25-(OH) D was significantly lower with patients complaining of non-specific skeletal pain compared to controls with a positive association between defiance and skeletal pain like leg pain, arthralgia and widespread pain with greater positive associations in women compared with men.

Babita Ghai *et al.*, [9] reported the mean vitamin level 18.4 ng/mL among patients with chronic low back pain with mean values of 17.3 ng/mL for men and 19.6 ng/mL for women.

LIMITATIONS

Keeping the limitations in view, the present study was planned and executed effectively to obtain results which are not affected by seasonal variation, diet, and exposure to sunlight or other confounders because population recruited for this study were selected from the same geographic territory who had unique racial and cultural backgrounds, with similar diet and sunlight exposure. Therefore, more studies should be done in different geographical areas. It would enable us to correlate these studies thereby leading to a more valid conclusion.

CONCLUSION

In conclusion, the mean value of the study population with musculoskeletal symptoms was lower than the optimal level of 30 ng/mL and several other studies had also proved that the level of vitamin D was

low among symptomatic patients with musculoskeletal pain. Importance has to be given to adequate vitamin D supplementation in the patents vitamin D deficiency.

In the present study, it is proven that adequate vitamin D3 Supplementation in patients of musculoskeletal pain is highly important in the Management. Hence, Empirical supplementation of Vitamin D3 is advisable in all patients of musculoskeletal pain.

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