

Original research article

Prevalence of vitamin D deficiency among Indian menopausal women

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Abstract

Background: Due to poor exposure to sunlight and insufficient intake of vitamin D from diet, vitamin D deficiency is common among all age groups, and it is especially prevalent among women after menopause [1]. Vitamin D deficient postmenopausal women are prone to develop serious complications such as osteoporosis and consequent catastrophic fractures of the neck of the femur and vertebral column [2]. The prevalence of vitamin D deficiency in postmenopausal women varies in different countries

Aim and Objective: To evaluate the prevalence of Vitamin D deficiency among postmenopausal women.

Materials and Methods: This cross sectional observational study was carried out at Obstetrics and Gynaecology department, IGIMS, Patna, over the period of 1 year, from 2018- 2019, among 192 apparently healthy postmenopausal women (with 1 year of menstruation cessation) without known history of diabetes, thyroid, renal or hepatic disease or malignancy. Patients with surgical and other iatrogenic causes of menopause, history of surgery, hospitalization, or major medical illness within the past 1 year or on hormone replacement therapy, biophosphonates, teriparatide, glucocorticoids and other drugs affecting bone metabolism, were excluded from the study. On the basis of 25 (OH) D concentrations, measured by competitive in-vitro quantitative immunoassay, < 20 ng/mL, 20–30 ng/mL or > 30 ng/mL, patients were classified as vitamin D-deficient, insufficient or sufficient respectively.

Results: In post-menopausal women, the vitamin D deficiency was observed in 102 women (53.13%) out of 192 postmenopausal healthy population, 38 women (19.79%) had insufficiency and 52 women (27.08%) had adequate Vitamin D levels. The most common factors associated with inadequate vitamin D levels included limited sun exposure, lack of dietary vitamin D intake.

Conclusion: High prevalence of vitamin D deficiency exists even among apparently healthy Indian postmenopausal women. So, proper precaution should be taken to prevent the complications.

Keywords: Postmenopausal women, Vitamin D deficiency, Insufficiency, Osteoporosis.

Introduction

Vitamin D deficiency is a worldwide epidemic health problem, and it ranges between 70%–100% in the general population.[3] Prevalence of varying degrees (50-90%) has been reported among Indian population with low dietary calcium intake.[4] A high prevalence of vitamin D deficiency has been reported by various researchers in various groups of the population like healthy school children, adolescents, rural girls, pregnant women and health care

professionals.[5,6,7] Various studies do exist reporting high prevalence of Vitamin D deficiency among postmenopausal women (PMW) from India and western world but data still remain scanty.[8,9,10,11,12] Furthermore, few epidemiological studies have shown an association of vitamin D deficiency and increased risk of chronic diseases like cardiovascular disease, type 1 and 2 diabetes (T1D, T2D), cancer, suggesting that that vitamin D deficiency not only affects musculoskeletal health but also affects a wide range of chronic diseases.[13] So, it's important to know the prevalence of vitamin D deficiency among apparently healthy postmenopausal women.

Materials and methods

This cross sectional observational, 1 - year analysis, was carried out at Obstetrics and Gynaecology department, IGIMS, Patna, from 2018-2019, among 192 apparently healthy postmenopausal subjects (with 1 year of menstruation cessation) without known history of diabetes, thyroid, renal or hepatic disease or malignancy. Surgical and other iatrogenic causes of menopause were excluded from the current study. Patients with history of surgery, hospitalization, or major medical illness within the past 1 year were also excluded from the study. Patients on hormone replacement therapy, biophosphonates, teriparatide, glucocorticoids and other drugs affecting bone metabolism were excluded as well. Intake of conventional calcium/vitamin D supplements was not considered an exclusion criterion. All subjects were enrolled after taking a written informed/voluntary consent.

The 25-hydroxy vitamin D [25 (OH) D] concentrations were measured by competitive in-vitro quantitative immunoassay in human serum using Elecsys & Cobas e analyzers (Roche) kit. Inter-assay Coefficient of Variability (CV) was 9.9% and intra-assay CV was 5.7% in the current analysis. The minimal detectable limit of the 25 (OH) D assay was 1.5 ng/mL.

According to recent consensus, the subjects were classified as vitamin D-deficient, insufficient or sufficient on the basis of 25 (OH) D concentrations of < 20 ng/mL, 20-30 ng/mL or > 30 ng/mL respectively.[14,15]

Statistical Analysis

The data was categorised as mean \pm SD and N (%).

Results

Total of 192 apparently healthy postmenopausal women participated in the current study. Mean age of study population was 55.13 with mean \pm SD number of menopausal symptoms were 3.160 ± 1.17 . The most common menopausal symptoms in the current study are depicted in the following table.

Table 1: Profile of the study population

Study Parameters
N=192
Mean Age of study Population=55.13
Urban:Rural= 130 (67.71%):62 (32.29%)
Mean Number of Symptoms: 3.160 ± 1.17
Most Common Symptoms
Fatigue, rheumatic pain, lack of energy= 37.5%
No Symptoms= 31.77%
Urogenital Symptoms= 17.71%
Cold hand and feet= 17.71%
Sweats, Irritability, Weight gain, Nervousness= 13.02%
Palpitation of heart, anxiety, insomnia= 11.98%

Mean Vitamin D level of total population= 25.91 ng/ml
Vitamin D status of the study population
Deficiency < 20 ng/ml = 102 (53.13%)
Insufficiency 20-30 ng/ml = 38 (19.79%)
Adequacy = 52 (27.08%)

Mean vitamin D levels of the study population was 25.91 ng/ml. 53.13% of the population had vitamin D deficiency, 19.79% had insufficiency and 27.08% had adequate vitamin D levels.

Discussion

Vitamin D deficiency is a worldwide pandemic, with a prevalence of 70%–100% in the general population both in rural and urban populations and across all socioeconomic strata.[3] Previous studies have also reported very high prevalence of vitamin D deficiency among postmenopausal women from western world and India.[8,9,10,11,12] In Europe, a study carried among women aged over 80 years showed, the prevalence of 25 (OH) D inadequacy was 80.9% and 44.5% when considering cut-offs of 75 and 50 nmol/L, respectively.[8] Results of a study among urban central south Chinese postmenopausal women showed 72.1% women to be vitamin D deficient [25 (OH) D < 50 nmol/L].[16] One of the recent Indian study also showed that Vitamin D deficiency was seen in 83.7% of the subjects (≤ 20 ng/mL) at baseline among Indian postmenopausal women.[17] Another study showed that about 82% of the study group had varying degrees of low 25 (OH) D levels among Indian postmenopausal women who were having insufficient calcium and high phytate diet.[9] 25 (OH) D deficiency (< 20 ng/ml), insufficiency (20–30 ng/ml) and replete states (> 30 ng/ml) were seen in 76%, 16.5%, 7.5% vs 70%, 23% and 7% respectively, when women of reproductive age group were compared with postmenopausal group.[18] Unlike our study, postmenopausal women with established osteoporosis, showed serum vitamin D to be deficient in two third of patients.[19] Thus, prevention and early detection of hypovitaminosis D is the key factor to reduce the incidence of osteoporosis among postmenopausal women. One study suggested that vitamin D deficiency is a potential risk factor for obesity and development of insulin resistance leading to type 2 Diabetes Mellitus.[20] Another study showed no correlation between serum 25 (OH) D level with markers of insulin resistance (IR) in postmenopausal Indian women.[17] Chacko SA *et al.*,[21] showed that higher serum 25 (OH) D concentrations may be inversely associated with metabolic syndrome, adiposity, triglycerides, and triglyceride: high-density lipoproteins (HDL) cholesterol ratio but were not associated with low-density lipoproteins (LDL) and HDL cholesterol, insulin and glucose in postmenopausal women. Thus, serum 25(OH) D levels affect not only skeletal system but also overall well being of women and it's level should be normal for having good health. Sample size of the study is too small to generalize results of the study to apparently healthy postmenopausal Indian population. However, it addresses a major nutrition related health problem in apparently healthy postmenopausal Indian population, which needs attention.

Conclusion

High prevalence of vitamin D deficiency exists even among apparently healthy postmenopausal Indian women. So, it's very important to prevent and treat the hypovitaminosis D, to prevent the complications in old age population.

Footnotes

Source of Support: None

Conflict of Interest: None declared.

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Received:20-10-2020.

Revised:10-11-2020.

Accepted:30-11-2020