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Original Research Article

Prevalence of Vitamin D deficiency in postmenopausal women of a tertiary care institution, Jammu

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Abstract

Background: Vitamin D also called the sunshine medicine, is required for the bone metabolism and calcium homeostasis. Post-menopausal women face various health challenges among which vitamin D deficiency is commonly seen.

Aim & Objectives: To determine the prevalence and symptom patterns of vitamin D deficiency among postmenopausal women of Govt Medical College Jammu.

Materials and Methods: The study was conducted in 100 postmenopausal women of GMC Jammu. It was a hospital based cross sectional study. Serum levels of Vitamin D were assessed and the symptoms of vitamin D deficiency were studied.

Results: 62 % of the total postmenopausal women of Govt medical college Jammu were found to have vitamin D deficiency, 16 % had insufficient levels and 22 % had sufficient levels of vitamin D.

Conclusion: Postmenopausal women of Govt Medical College Jammu showed Vitamin D deficiency. Postmenopausal women should be counselled about importance of vitamin D supplementation, adequate dietary intake & sun exposure.

Keywords: Vitamin D, Postmenopausal women

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1. Introduction

Vitamin D deficiency is considered as an important public health problem. The occurrence of vitamin D receptor (VDR) in all the human cells is linked with many non-communicable chronic diseases like obesity, hypertension, diabetes, metabolic syndrome (MetS), and cardiovascular diseases. In the cardiovascular system, Vitamin D receptors are present in the vascular smooth muscle, endothelium, and cardiomyocytes. Hence, Vitamin D deficiency is important risk factor for heart disease and one of the crucial causes of death in the postmenopausal women.[1]

Synthesis of vitamin D i.e. cholecalciferol depends on the sun exposure in the skin which is an important natural source for Vitamin D. Most of the Vit D deficiencies occur because of lack of Vitamin D synthesis in our body. Personal (age, clothing, skin type and sunscreen lotions) and environmental factors (season, latitude, clouds etc) influence the synthesis of Vitamin D in our body. Foods having Vitamin D are egg, milk, margarine, salmon, mackerel, and cod liver oil. Vitamin D plays an important role in calcium homeostasis and bone metabolism.[2] It also has an important role in the growth of bone by increasing the intestinal absorption of calcium.[3]

Vitamin D is important in many extra skeletal diseases like cancer, infections, neurological and various autoimmune diseases. The onset of menopause increases the incidence for osteoporosis, muscle weakness, colorectal cancer and breast cancer, diabetes, infections, neurologic diseases, cardiovascular diseases etc. One of the most important factor for Vitamin D status is 25- hydroxy Vitamin D. Vitamin D deficiency has a high prevalence and may contribute to many diseases. The prevalence of vitamin D deficiency is 70 to 100 % of the Indian population.[4]

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Dietary intake of vitamin D is important as vitamin D is necessary for the prevention and treatment of rickets in children and osteomalacia in adults. Thus, it has important role in skeletal health. The problem associated with menopause in women increase as the age progresses.[5]

Minimal sun exposure, less vitamin D intake, process of ageing and sedentary lifestyle contributes to higher level of vitamin D insufficiency among postmenopausal women. Also, parathormone levels increase as the age progresses because of decreased renal function thus requiring high levels of vitamin D. Due to ovarian failure, oestrogen gradually decreases in postmenopausal women, often causing hot flushes, sleep disturbances, night sweats, loss of libido, and leading to osteoporosis and causing cardiovascular disease.[6] Estrogen therapy is thus important for menopausal women. They are at high risk of decreased bone density and more risk for fracture due to decreased estrogen levels in the body. There is increased susceptibility for cardiovascular disease, diabetes, hypertension, and hyperlipidaemia.[7]

Its deficiency interferes with the regular functioning of fat tissue and thus affects metabolic health drastically. As Obesity is considered as an important public health issue, it can lead to insulin resistance that causes dyslipidaemia and glucose resistance.[8] Vitamin D deficiency symptoms consist of back pain, painful joints, muscle weakness, headache, fatigue, altered mood, less sleep and alopecia.[9]

Postmenopausal women due to lack of estrogen levels are at risk of osteoporosis. This can drastically decrease the bone mineral density. Hence, vitamin D supplementation helps in increasing bone mineral density. Vitamin D supplementation increases serum 25(OH)D levels, causes normal parathyroid hormone and bone markers.[10] Vitamin D and calcium intake helps in reducing central fat deposits. In prediabetic women with less Vitamin D levels, vitamin D intake helps in improving the sensitivity of insulin. Vitamin D decreased levels are linked with risk of metabolic syndrome in postmenopausal women and Vitamin D intake causes decrease in triglycerides, increases insulin and HOMA-IR level.[11]

In studies, containing population with males and females, it has been seen that metabolic syndrome is linked with Vitamin D insufficiency. Supplementation with calcifediol is also advantageous as it has more intestinal absorption than cholecalciferol and increased ability for vitamin D binding protein. The oral administration is more affective for calcifediol as it has 3- 4 times more intestinal absorption than cholecalciferol. However, the available studies for calcifediol are less.[12]

Many studies have showed the advantages of vitamin D intake in individuals with deficient (20–30 ng/ml) or insufficient (<20 ng/ml) 25-hydroxyvitamin D concentrations. But the active hormone is 1α, 25 dihydroxy vitamin D that acts by directly binding to vitamin D receptors. It also regulates the parathyroid hormone and calcium and phosphate metabolism.[13] In the literature, it was obvious that Vitamin D insufficiency was common among the elderly and caused osteopenia and osteoporosis.[14-16] The menopause comes with many serious problems like osteoporosis, muscle weakness, cardiovascular disease etc. Even Vitamin D deficiency is a causative factor for muscle weakness and many falls.[17-21] Insufficient vitamin D levels cause increased level of parathormone causing increased remodelling of bone that leads to weakening of bone eventually causing less muscle strength, decreased neuromuscular conduction and increased risk of fractures and falls.[22] Many studies have shown that vitamin D supplementation in daily life and adequate sun exposure has decreased the risk for fractures & falls.[23]

In a randomized controlled trial, supplementation of Vitamin D with 4000 IU per day for 12 weeks regularly showed improvement in Vitamin D insufficiency, better insulin secretion with sensitivity in 89 subjects with prediabetes.[24] Improvement in insulin and HOMA-IR with decrease in insulin resistance was seen in 100 patients with type 2 diabetes who were supplemented with 50,000 IU of Vitamin D orally per week for a duration of 8 weeks.[25] In many studies, results depicted that woman with more Vitamin D levels showed better lipid profile as compared to those women with vitamin D deficiency.[26]

Postmenopausal women without any risk factor must expose themselves to sunlight without using any sunscreen for 15 min, 3-4 times per week to generate sufficient Vitamin D levels. Remaining women should take recommended daily dose of 600 IU of cholecalciferol for 70 years and 800 IU for 71 years or above.[27] The aim of our study was to determine the prevalence and symptom patterns of vitamin D deficiency among postmenopausal women of Govt Medical College Jammu. This specific group is important because decreased oestrogen levels cause less mineralization of bone, osteoporosis, and higher risk of fractures.

2. Material and Methods

The present study was done in 100 postmenopausal women of Govt medical college Jammu. It was done for a duration of 6 months. They were selected randomly by using random sampling technique.

Predesigned pretested semi structured Performa was used to collect data which included information on socio-demographic characteristics-age, residence, & symptoms. Levels of Vitamin D were assessed by Abbott i 1000 SR autoanalyzer. Informed written consent was given by the postmenopausal women and the research was also approved by the Ethics Committee of Government Medical College Jammu via C-279. The deficiency of Vitamin D occurs when its level is below12 ng/mL (30 nmol/L). Insufficiency is seen when the levels are between 12 and 30 ng/mL (30-77 nmol/L) and sufficient levels are 30 ng/mL (75 nmol/L).

2.1. Inclusion criteria

Subjects were enrolled for the study after a thorough history taking and clinical examination. Apparently healthy subjects having given a written consent to participate in the study were included. The subjects included postmenopausal women.

2.2. Exclusion criteria

1. History of Diabetes, Hypertension, Cardiopulmonary disease, and any recent illness.
2. History of any addiction.
3. History of any inherited /acquired disorder.
4. Those having any physical disability.
5. Those on any medications

2.3. Statistical analysis

Data was presented with the use of appropriate tables and graph charts. The statistical analysis was conducted with the help of SPSS Microsoft version 22.

3. Results

100 postmenopausal women of Govt Medical College Jammu were studied. Their levels of Vitamin D were assessed by Abbott i 1000 SR autoanalyzer.

Table 1: Profile of the study population

Age of study population mean ±SD (years)	**60.22 ± 2.1**	
Residence		
Urban	75	
Rural	25	
Number of symptoms (Mean ± SD)	3.120 ± 1.13	
Most Common Symptoms		P-value
Fatigue, lack of energy, rheumatic pain	26	<0.01
Cold hand and feet		
Urogenital Symptoms	16	<0.01
Cold sweats, weight gain, irritability, and nervousness	10	<0.01
Palpitation of heart, excitable/anxiety/Insomnia		
No symptoms	5	<0.1
	7	<0.1
	36	<0.01
Vitamin D levels (Mean ± SD)	25.86 ng/ml	

Table 1. Shows the profile of the study population with mean age of the postmenopausal women was 60.22 ± 2.1. 75 out of 100 postmenopausal women belonged to urban area and 25 among them were from rural area. The various symptoms of Vitamin D deficiency were studied and they were significant with p value < 0.

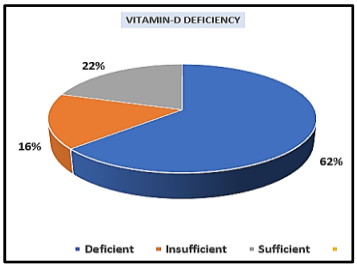

Figure 1: Pie chart showing the percentage of Vitamin D deficiency among the postmenopausal women.

62 % of the total postmenopausal women showed vitamin D deficiency, 16 % showed insufficient levels and 22 % showed sufficient levels of vitamin D.

4. Discussion

The present study was done in 100 postmenopausal women of GMC Jammu that showed vitamin D deficiency in 62% of women, insufficiency in 16% and sufficient level were seen in 22% of them. Our study is in accordance with a study from North India by Narula R, et.al. Which was done in 190 postmenopausal women that had vitamin D deficiency among 62% of postmenopausal women[28] Capatina C, et al. in his study in 123 postmenopausal women of Romania showed 91.9% with 25(OH)-Vit D levels less than 30 ng/dl[29]. Similar study in Pakistan with 200 postmenopausal women showed that prevalence of vitamin D deficiency was 59% and 22% showed insufficient levels.[30] A study from North India also showed similar findings with vitamin D deficiency in 62% of the postmenopausal women.[31]

5. Conclusion

Postmenopausal women of GMC Jammu showed high prevalence of Vitamin D deficiency. These women should be counselled about the importance of proper dietary intake, adequate Vitamin D, and proper sun exposure. Food fortification with Vitamin D is required and should be approved by political authorities unanimously. Vitamin D supplementation will also prevent number of falls and fractures. There should be regular testing of Vitamin D of postmenopausal women so that Vitamin D deficiency can be detected and early Vitamin D supplementation is started.

6. Limitations

1. Small sample size.
2. Lack of dietary and lifestyle data analysis
3. Lack of seasonal variation control.

7. Ethical No:

IEC/GMC/2022/1042

8. Source of Funding

None.

9. Conflict of Interest

None.

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Conflict of Interest

None.

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