

## COMPARISON OF VITAMIN D LEVELS IN POST-MENOPAUSAL WOMEN WITH AND WITHOUT HYPOTHYROIDISM IN ANDHRA PRADESH POPULATION

Mounika Nadella<sup>1</sup>, Pandala Sravanthi<sup>2</sup>

Received : 23/04/2023  
Received in revised form : 24/05/2023  
Accepted : 02/06/2023

**Keywords:**

Vitamin D, Thyroid profile, post-menopausal, Andhra Pradesh.

**Corresponding Author:**

Dr. Mounika Nadella,  
Email: mounika.nadella6@gmail.com

DOI: 10.47009/jamp.2023.5.3.282

Source of Support: Nil,  
Conflict of Interest: None declared

Int J Acad Med Pharm  
2023; 5 (3); 1390-1392



<sup>1</sup>Assistant Professor, Department of Obstetrics and Gynaecology, NRI Medical College Chinakakani Guntur, Andhra Pradesh, India.

<sup>2</sup>Assistant Professor, Department of Obstetrics and Gynaecology, NRI Medical College Chinakakani Guntur, Andhra Pradesh, India.

### Abstract

**Background:** Many smaller studies have previously shown a significant association between vitamin D deficiency and thyroid auto antibody induced hypothyroidism. However these findings have not been confirmed by pragmatic studies. Hence evaluation between vitamin D levels with hypothyroidism and without hypothyroidism was done. **Materials and Methods:** Out of 90 Post-Menopausal women 45 had suggestive symptoms of hypothyroidism and 45 were controlled group were studied 50 ml blood sample was withdrawn from every patients and serum. TSH, T3, T4 and 25-OH vitamin D levels were studied and obtained results were compared in both hypothyroidism and normal post-menopausal women. **Result:** In hypothyroidism groups TSH was between 0.32-0.33 and normal group had 0.34 to 5.60 IU/L. In hypothyroidism T3 was between 1.30-1.33 and in controlled group 1.34 to 2.73. In hypothyroidism group 68-69.30 and in normal group 70.53-183.81 and in 20 women had < 10mg/ml vitamin deficient, 25 women had 10-30 mg/ml vitamin D and controlled had 35-100 mg/ml. **Conclusion:** Age was the independent predictor of serum vitamin D and suppressed. Thyroid profile was associated with reduced vitamin D levels hence hypothyroidism suffers with reduced vitamin D levels thus vitamin D is has to be recommended in hypothyroidism in post-menopausal women.

## INTRODUCTION

The most important role of vitamin D is to maintain calcium and phosphorous homeostasis and to preserve bone health.<sup>[1]</sup> Vitamin D has been involved in the pathogenesis of several endocrine conditions such as type-I and type-II Diabetes, adrenal diseases. It is observed that, there is strong homology between the molecular structure of vitamin D3 receptor and the receptor of thyroid hormone, which is due to two regions that they have in common;<sup>[2]</sup> the first is a 70 amino acid cysteine-rich sequence and the second region is 62 amino acids one located towards the carboxyl terminus of the protein.<sup>[3]</sup> It is also noted that, low vitamin D concentrations genes favour the development of Hashimoto's thyroiditis and grave diseases has reduced 25 hydroxy vitamin D,<sup>[4]</sup> but least data is available about thyroid profile and vitamin D levels. Hence attempt is made to correlate the vitamin D levels in hypothyroidism and without hypothyroidism in post-menopausal women. So that

present study can be a guide lines to clinician for treating such patients.

## MATERIALS AND METHODS

90 post-menopausal women regularly visiting NRI Medical College Mangalagiri Road, Chinakakani, and Guntur-522503 Andhra Pradesh were studied.

### Inclusion Criteria

Post-menopausal women above 50 years having symptoms suggestive of hypothyroidism were selected for study.

### Exclusion Criteria

Patients already on medication for thyroid disorders, diabetes mellitus, and vitamin D supplementation patients having renal or hepatic diseases, mal-absorption syndromes, or gastric binding surgeries, patients on hormonal replacement therapy were excluded for study.

### Method

45 post-menopausal women having symptoms of hypothyroidism and 45 (Normal) controlled groups post-menopausal also selected for the comparison of

both results, 5 ml of various blood samples was withdrawn and serum was separated by configuration. Serum sample was analysed for TSH, T3, T4, and 25-OH vitamin D level using commercially available kits on fully automated clinical chemistry Beckman Access-2 analyser based on principle of chemiluminescence Immune assay (CIA) method. Reference values were – serum T3 (1.34-2.73) nmol/L, T4 – 70.53-183.81 nml/L and TSH – 0.34-5.60  $\mu$  IU/ml. Serum 25-OH vitamin D level 30-100 mg/ml Normal value.

Duration of study was October-2020 to November-2021.

#### Statistical analysis

Values of thyroid profile and vitamin D were noted and compared in both groups. The statistical analysis was carried out SPSS software.

## RESULTS

[Table 1] Study of thyroid profile in both groups

- Serum TSH was 0.32 – 0.33 in hypothyroid women and 0.34 – 5.60 in controlled group
- Serum T3 level was 1.32 – 1.33 in hypothyroid women and 1.34 – 2.73 in controlled group
- Serum T4 level was 68 – 69.30 in hypothyroid women and 70.53 – 183.81 in controlled group

[Table 2] Distribution of vitamin D status in post-menopausal women

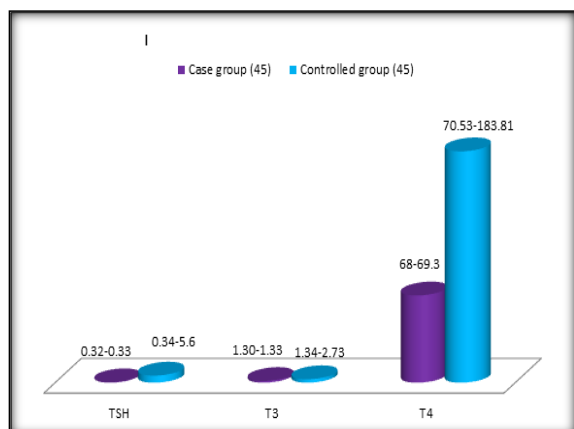
- 20 women had 10 mg/ml vitamin D (deficient)
- 25 women had 10-30 mg/ml vitamin D (Insufficient) women
- 45 Controlled group had 30 – 100 mg/ml (Normal)

**Table 1: Study of thyroid profile in both groups of post-menopausal**

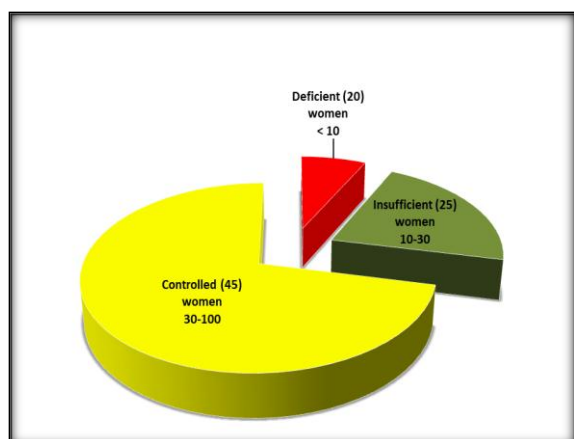
Groups	Case group (45)	Controlled group (45)
TSH	0.32 – 0.33	0.34 – 5.60 IU/L
T3	1.30 – 1.33	1.34 – 2.73
T4	68 – 69.30	70.53 – 183.81

**Table 2: Distribution of vitamin D status in controlled, deficient and insufficient**

Deficient (20) women	Insufficient (25) women	Controlled (45) women
< 10 mg/ml	10 – 30 mg/ml	30 – 100 mg/ml



**Figure 1: Study of thyroid profile in both groups of post menopa**



**Figure 2: Distribution of vitamin D status in controlled, deficient and insufficient**

## DISCUSSION

Present comparative study of vitamin D levels in post-menopausal women with and without hypothyroidism in Andhra Pradesh Population. In case group TSH was 0.32-0.33 and 0.34-5.60 in controlled group, T3 was 1.30 in case group and 1.34-2.73 in controlled group, T4 68-69.30 in case group and 70.53-183.81 in controlled group (Table-1). Vitamin D status was < 10mg/ml in 20 cases, 30-100 mg/ml in controlled group [Table 2]. These findings are more or less in agreement with previous studies.<sup>[5,6,7]</sup>

Vitamin D is a steroid molecule, mainly produced in the skin, which regulates the expression of large number of genes. The vitamin D receptor (VDR) is found in most tissues and cells in the body. The main role of vitamin D is regulating bone metabolism and calcium and phosphorous homeostasis. It was suggested that, vitamin D deficiency could have non-skeletal actions including an important role in auto-immune diseases, cancers, metabolic syndromes, cardio vascular disease and infection, as well as cause mortality such as Hashimoto thyroiditis (HT) and Grave disease (GD) and thyroid tumorigenesis.<sup>[8]</sup>

Vitamin D plays a significant role in modulation of the immune system, enhancing the innate immune response while exerting an inhibitory action on the adaptive immune system. Most immune cells including T cells, B cells, These T cells have polarisation towards Th2 phenotype which leads more tolerogenic immune status and promotes

immune tolerance and beneficial for number of auto-immune disease.<sup>[9]</sup>

The present study indicates that patients with hypothyroidism also suffer from vitamin D deficiency. Thyroid hormones exert important effect on the skin causing epidermal thinning and hyperkeratosis. Epidermal barrier function is probably impaired due to hypothyroidism which may lead to reduced synthesis of vitamin D.<sup>[10]</sup> This condition is severe in post-menopausal women. They must be counselled regarding vitamin D supplementation and sun exposure.

It is also suggested that vitamin D deficiency and hypothyroidism is due to old age and there was no linear association between vitamin D deficiency and hypothyroidism in post-menopausal women.

#### **Limitation of study**

Owing to tertiary location of studied hospital, small number of patients, lack of latest technologies we have limited results.

### **CONCLUSION**

Post-menopausal vitamin D is deficient and associated with hypothyroid. It demands proper nutrition, healthy environment because deficiency of vitamin D in post-menopausal is physiological. This pathogenesis has resulted in hypothyroidism. This study demands further patho-physiological,

nutritional, genetic, hormonal, environmental studies because exact pathogenesis of association of vitamin D deficiency and hypothyroidism is still unclear.

### **REFERENCES**

1. Basit S – Vitamin D in health and disease: a literature review. *Br. J. Biomed. Sci.* 2013, 70; 161-172.
2. Song Y, Wang L - Blood 25-hydroxy vitamin D levels and incident type-2 diabetes. *Diabetes care* 2013, 36; 1422-1428.
3. Lopez ER, Zwermann O – A promoter polymorphism of cyp27b1 gene associated with Addison's disease, Hashimoto's thyroiditis, Grave disease and diabetes. *Eur. J. Endocrinol.* 2004, 151; 193-197.
4. Lamberg – Allardt C, Valtonen E – Characterization of a 1.25-dihydroxy-vitamin D3 receptor in FRTL-5 cells *Mol. Cell Endocrinol.* 1991, 81; 25-31.
5. Holick MF – Vitamin D deficiency *N. Engl. J. Med.* 2007, 357 (3); 266-81.
6. Mac Laughlin T, Holick MF – Aging decreases the capacity of human skin to produce vitamin D3, *J. Clin. Invest* 1985, 76(4); 1536-8.
7. Hyponen E, Laara E – Intake of vit. D and risk of type-I diabetes A birth Cohort study *Lancet* 2001, 358 (9292); 1500-3.
8. Klecha AJ, Barreiro Arcos – Immune endocrine interactions in auto-immune thyroid diseases *Neuro immune modulation* 2008, 15; 68-75.
9. Prietl B, Treiber G – Vitamin D and immune function *Nutrients* 2013, 5; 2502-2521.
10. Hanley K, Jiang Y – Epidermal steroid sulfatase and cholesterol sulfotransferase are regulated during late Invest in foetal rat. *J. Invest Dermatol.* 1997, 108 (6); 871-5.