



## Editorial

# Unveiling the sun-kissed connection: Vitamin D status and TSH levels in postmenopausal women

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Vitamin D (VitD) deficiency is a worldwide health concern that affects a sizable section of the population, with repercussions that extend beyond bone health. The complex link between VitD status and thyroid function, particularly in postmenopausal women, has recently gotten much attention because of the possible consequences for overall health. Osteoporosis, a well-known consequence of VitD deficiency, is common in this community. This study aims to provide insight into the relationship between VitD and thyroid-stimulating hormone (TSH) levels in postmenopausal women.<sup>1</sup>

Numerous studies have found that low serum vitamin D levels are linked to various ailments, including high blood pressure, heart disease, diabetes, cancer, mood disorders, multiple sclerosis, and autoimmune diseases.<sup>2</sup>

Vitamin D deficiency is common in older populations worldwide, with more than 60% of postmenopausal women deficient, regardless of other dietary inadequacies. Observational studies have linked optimal blood 25(OH)D levels to enhanced musculoskeletal function and muscle strength. Furthermore, postmenopausal people with low vitamin D levels had reduced upper and lower limb muscle strength.<sup>3</sup>

For a considerable time, it has been recognized that insufficient Vitamin D levels play a role in the development

of osteopenia and osteoporosis. Since Vitamin D receptors are found in all human cells, irrespective of their diverse embryonic origins, numerous studies have delved into the non-skeletal impacts of Vitamin D and its influence on overall patient well-being. Alongside a constrained intake via the mouth and a decline in absorption linked to aging, one of the primary contributors to inadequate Vitamin D levels in women is reduced exposure to sunlight.<sup>3,4</sup>

Changes associated with aging that contribute to lower levels of this vitamin in the bloodstream occur due to a decrease in the synthesis of Vitamin D precursor in the skin's lower layer. Additionally, there are reductions in the absorption of cholesterol-based provitamin molecules from daily dietary intake.<sup>4</sup>

The metabolism of Vitamin D is reciprocally influenced by thyroid hormones as well. Provitamin D<sub>3</sub> is produced from 7-dehydrocholesterol, primarily through enzymatic reactions occurring in the basal and spinous layers of the epidermis, mainly in keratinocytes. In contrast, thyroid hormones exert significant effects on the skin. Examination of the skin in hypothyroid individuals has revealed changes indicative of thinning of the epidermis and increased formation of keratin, a protein in the skin's outer layer. There's a strong indication that the protective function of the epidermal barrier might be compromised in hypothyroidism. This raises the possibility that Vitamin D synthesis could be diminished in individuals

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with pronounced hypothyroidism and elevated thyroid-stimulating hormone (TSH) levels.<sup>5</sup>

It might have been anticipated that there would be a connection between higher TSH levels and decreased Vitamin D reserves. However, we didn't observe such a link, likely due to the relatively limited number of patients with elevated TSH levels, and the absence of cases with extremely high TSH levels.<sup>4–6</sup>

We intend to investigate the relationship between serum levels of VitD and thyroid-stimulating hormone (TSH) in postmenopausal women. We expect blood Vit D levels to be lower in postmenopausal women with elevated serum TSH concentrations owing to decreased production.

Postmenopausal women, a demographic already navigating hormonal changes, are particularly interested in this study. Fluctuating hormone levels during menopause can impact thyroid function and potentially exacerbate any existing deficiencies in Vitamin D. Thus, exploring the correlation between Vitamin D status and TSH levels in this cohort holds promise for uncovering insights that could improve their quality of life.

Singh et al., in their article in this issue, had rightly emphasized the importance of monitoring and treating these conditions in postmenopausal women to ensure their overall health and well-being. A total of 60 patients in the postmenopausal group were identified and enrolled, and their vitamin D levels and thyroid stimulating hormone levels were checked and were found to have 35% of patients had insufficient vitamin D levels, and 18.3% of patients had deficient vitamin D levels. They concluded that Vitamin D insufficiency and an underactive thyroid are prevalent among women after menopause. They found no direct relationship between elevated TSH levels and reduced Vitamin D levels. Therefore, it is recommended that all postmenopausal women undergo tests to assess thyroid function and measure serum Vitamin D levels. Treating these conditions effectively is essential, as it can help prevent complications associated with cardiovascular and metabolic issues, ultimately reducing mortality risks in this demographic.

In a study by Taheriniya et al. systematic review and meta-analysis provide insights into the potential link between vitamin D levels and different thyroid disorders. While an association between low vitamin D levels and hypothyroidism is indicated, the relationship with Graves' disease appears to be less clear, potentially influenced by age. The study also highlights the need for more comprehensive research to address the existing heterogeneity and provide a clearer understanding of the role of vitamin D in thyroid disorders.<sup>2</sup>

In Tabrizi et al., while the current meta-analysis did not find a significant effect of vitamin D supplementation on muscle function markers in postmenopausal women, it emphasizes the need for more studies to validate these findings and to comprehend better the potential impact

of vitamin D supplementation on muscle function in this demographic.<sup>3</sup>

In a study by Niafar et al. TSH was not found to be a contributing factor, with age emerging as the sole significant predictor of Vitamin D levels. Conversely, the linear regression analysis identified no predictor for TSH levels, including age and Vitamin D.<sup>4</sup>

A study by Ansari et al. reveals thyroid and vitamin abnormalities in different stages of chronic kidney disease; hence vita d status and thyroid dysfunction should be evaluated in every patient especially in the post-menopausal state.<sup>5</sup>

As the medical community continues to unravel the intricacies of women's health, the significance of recognizing the broader impact of VitD deficiency and its potential role in hormonal equilibrium. By acknowledging and addressing the relationship between VitD and TSH levels, healthcare practitioners can contribute to more comprehensive approaches to managing the health and well-being of postmenopausal women, potentially minimizing the risk of thyroid-related complications and promoting overall vitality.

## 1. Conflict of Interest

None.

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