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Role of Confounding Factors in the Evaluation of Vitamin D Deficiency

Masoud Nouri-Vaskeh[1], Elaheh Ouladsahebmadarek[2*]

Dear Editor,

Vitamin D has been traditionally used as a mineral regulator in preventing musculoskeletal disorders. Nowadays, the beneficial effects of vitamin D on the skeletal system and several body organs have been identified (1, 2). Recent studies have asserted that vitamin D contributes to the processes of anti-inflammatory and pro-inflammatory cytokines, as well as suppression of angiogenesis (3). The correlation between vitamin D level and several diseases has been investigated in numerous studies, however only a few have exactly considered the role of peripheral confounding factors on the levels of vitamin D. In the current letter, we aimed to define the important associated factors that should be taken into account in the determination of vitamin D deficiency in all patients and diseases in all regions.

Sunlight plays a critical role in vitamin D metabolism. It differs in various regions of the earth's surface, thereby making a difference in the amount of sunlight exposure. In addition, the sunlight exposure is important in the synthesis of endogenous vitamin D. However, inadequate exposure due to women's extensive coverage for religious or cultural reasons, for example, can affect vitamin D status. Furthermore, in some regions with hot climate, women have to stay at home during the day, and as a result, they will be divested of enough sunlight exposure (4). Moreover, the effects of pregnancy, ethnicity, skin color, and genetic background on vitamin D status are well-clarified (5). Recent studies have focused on aging and high prevalence of vitamin D deficiency among centenarians (6). Additionally, the effect of sunlight in various seasons, especially in winter, must be taken into consideration (7). In addition to parathyroid disorders, other comorbidities including chronic kidney or liver diseases play a crucial role in the serum levels of vitamin D (8, 9). The dietary habits such as eating a great deal of marine food can increase the vitamin D level; in contrast, malnutrition reduces its concentration (10, 11).

The 25(OH)D assay is a routine method for the diagnosis of vitamin D deficiency, and the stability of 25(OH)D is more than $1,25(OH)_2D$ owing to the longer half-life and higher concentration of 25(OH)D about 1000 fold (12).

The serum concentration of 25(OH)D is affected by thyroid disorders, as well as some drugs such as antiepileptics and cholestyramine. The serum levels of $1,25(OH)_2D$ can also be influenced by phosphate and calcium, as well as sedentary lifestyle. Moreover, the parathyroid hormone and its peptides, prostaglandins, estradiol, and prolactin have an influence on the metabolism of $1,25(OH)_2D$. The effect of drugs including heparin sodium, corticosteroids, statins, antihypertensives, anticonvulsants, anti-retroviral drugs, and bisphosphonates on $1,25(OH)_2D$ is indisputable (13). Higher body mass index is also an important confounding factor associated with incomplete response to vitamin D supplement therapy and elevation of 25(OH)D is less than expected (10). In addition, division of vitamin D deficiency into the groups of insufficiency and deficiency will make it easy to interpret the results.

Overall, considering the confounding factors with the ability of changing the levels of vitamin D is of great importance.

Conflict of Interests

None declared.

Ethical Issues

Not applicable.

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[1]Connective Tissue Diseases Research Center, Tabriz University of Medical Sciences, Tabriz, Iran. [2]Women's Reproductive Health Research Center, Tabriz University of Medical Sciences, Tabriz, Iran.
***Corresponding Author:** Elaheh Ouladsahebmadarek, Tel/Fax: +984135541221, Email: elmadarek33@gmail.com

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