Normal Vitamin D Levels

Maivel Emile Soby Gerges, Ghada Essam Aldin, Diaa Marzok Abdel Hamid and Mohamed Farouk Allam*

Department of Family Medicine, Faculty of Medicine, Ain Shams University, Egypt

*Corresponding author: Mohamed Farouk Allam, Environmental and Occupational Medicine, Faculty of Medicine, Ain Shams University, Cairo, Egypt, Email: farouk.allam@med.asu.edu.eg

Abstract

Vitamin D deficiency is a common public-health problem. Deficiency is more common in women than men, and the childbearing period is known to represent a particularly high-risk situation. High rates of poor vitamin D status are found among women during the childbearing period throughout the world. Women at reproductive age are a group that can be susceptible at earlier age for vitamin D deficiency and its complications as increase the risk of osteopenia, osteoporosis, muscle weakness, osteomalacia and pathological fractures and can worsen other chronic conditions, such as the polycystic ovary syndrome; it is also a risk factor for cardiovascular diseases, metabolic syndrome, some types of cancers and some autoimmune diseases. Several studies have identified a surprisingly high prevalence of vitamin D deficiency in all age groups such as in Europe after 14 population study, United States, Canada and Australia. Despite reported prevalence of vitamin D deficiency and insufficiency depend on the cut-off values used that vary between studies, an estimated 1 billion people worldwide have vitamin D deficiency or insufficiency or hypovitaminosis D. National surveys should be conducted in every country to determine normal levels of vitamin D in that country and the need for national screening programs for vitamin D deficiency.

Keywords: Vitamin D; Screening; Survey

Abbreviations: MENA: Middle East and North Africa; BMI: Body Mass Index

Mini Review

Vitamin D is a steroid hormone modulating several molecular and cellular functions, especially in the musculoskeletal system, besides its extra-skeletal role on the immune system, metabolism, cardiovascular system diseases and cancer. In addition, its association with decreased mortality was evident [1].

Vitamin D deficiency is a common public-health problem. Deficiency is more common in women than men, and the childbearing period is known to represent a particularly high-risk situation [2]. High rates of poor vitamin D status are found among women during the childbearing period throughout the world [3].

Middle East and North Africa (MENA) region registers some of the highest rates of hypovitaminosis D worldwide with taking into consideration female gender, multiparity, clothing style, season, socio-economic status and urban living are recognized predictors of hypovitaminosis D in adults [1].

Bodnar, et al. [4] had stated that women during the childbearing period, with a body mass index (BMI)
greater than 30 are at increased risk of vitamin D deficiency. Moreover, severe vitamin D deficiency can occur in young women, due to some calcium loss during pregnancy through fetal demands and increased urinary calcium excretion, which increases with advancing pregnancy [5].

Several factors have been identified in women with vitamin D deficiency like the lack of exposure to sunlight, the culture, (e.g. wearing long garments), the skin pigmentation, along with a low vitamin D dietary intake, long lactation periods, the use of skin sun blockers, tobacco smoking and obesity. However, women at reproductive age are a group that can be susceptible at earlier age for vitamin D deficiency and its complications as increase the risk of osteopenia, osteoporosis, muscle weakness, osteomalacia and pathological fractures and can worsen other chronic conditions, such as the polycystic ovary syndrome; it is also a risk factor for cardiovascular diseases, metabolic syndrome, some types of cancers and some autoimmune diseases [6].

Moreover, factors affecting serum vitamin D level includes age, sex, pubertal status, latitude, season, race, and ethnicity, dark skin or concealing clothing, which may lead to limited exposure even though living in tropical areas where sun-exposure is adequate, can cause vitamin D deficiency [7,8].

Vitamin D deficiency is defined as a 25(OH)D below 20 ng/ml (50 nmol/liter), and vitamin D insufficiency as a 25(OH)D of 21–29 ng/ml (525–725 nmol/liter) [9].

Most of studies worldwide used 25(OH)D to assess serum vitamin D level because 1,25-dihydroxyvitamin D (1,25(OH)2D) can be normal, high, or low in vitamin D deficiency. So, the most commonly used and most sensitive index for assessing vitamin D status is 25-hydroxy vitamin D (25(OH) D).

El Rifai, et al. [10] had stated that maternal vitamin D deficiency is a real problem in Egypt; this is generally related to high BMI, low fish consumption, low educational level, and limited skin exposure. So, this problem needs more investigations because also stated that in Egypt, data on clinical and subclinical vitamin D deficiency status are scarce [7].

Despite the abundant sunlight in Saudi Arabia, 100% of participants of 465 young adult Saudi females aged 19 to 40 years old in a study carried out in one of the primary care units had hypovitaminosis D with serum 25(OH) D ≤ 50 nmol/L which should be considered a public health problem [11].

A large exploring study of vitamin D status in Arabian Gulf on 7942 participants shown 85.4% deficiency in vitamin D level among all age groups and in both sexes with mean level of 25(OH) D was ≤ 20 ng/mL [12].

Several studies have identified a surprisingly high prevalence of vitamin D deficiency in all age groups such as in Europe after 14 population study, United States, Canada and Australia [13,14].

In India, 48% of 98 mothers and 52% of 98 infants have 25(OH)D less than 25 nmol/L [15].

In China, 89% of 323 adolescent girls in Beijing have serum 25(OH)D <50 nmol/L [16].

In Hong Kong, hypovitaminosis D, defined by a 25(OH)D concentration <50 nmol/L, has also been shown in 90% of 441 women and 60% of 504 Indonesian women [17,18].

Despite reported prevalence of vitamin D deficiency and insufficiency depend on the cut-off values used that vary between studies, an estimated 1 billion people worldwide have vitamin D deficiency or insufficiency or hypovitaminosis D [19,20].

In conclusion, national surveys should be conducted in every country to determine normal levels of vitamin D in that country and the need for national screening programs for vitamin D deficiency.

References


