

Normal Vitamin D Levels

Maivel Emile Soby Gerges, Ghada Essam Aldin, Diao Marzouk Abdel Hamid and Mohamed Farouk Allam*

Department of Family Medicine, Ain Shams University, Egypt

***Corresponding author:** Mohamed Farouk Allam, Department of Community, Environmental and Occupational Medicine, Ain Shams University, Cairo, Egypt, E-mail: farouk.allam@med.asu.edu.eg

Mini Review

Volume 3 Issue 2

Received Date: June 17, 2019

Published Date: July 05, 2019

DOI: 10.23880/phoa-16000138

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

1. Bassil D, Rahme M, Hoteit M, Fuleihan GE (2013) Hypovitaminosis D in the Middle East and North Africa: Prevalence, risk factors and impact on outcomes. *Dermato endocrinology* 5(2): 274-298.
2. Hyppönen E, Boucher BJ (2010) Avoidance of vitamin D deficiency in pregnancy in the United Kingdom: the case for a unified approach in National policy. *British Journal of Nutrition* 104(3): 309-314.
3. Halicioglu O, Aksit S, Koc F, Akman SA, Albudak E, et al. (2012) Vitamin D deficiency in pregnant women and their neonates in spring time in western Turkey. *Paediatric and Perinatal Epidemiology* 26(1): 53-60.
4. Bodnar LM, Simhan HN, Powers RW, Frank MP, Cooperstein E, et al. (2007) High prevalence of vitamin D insufficiency in black and white pregnant women residing in the northern United States and

- their neonates. *The Journal of Nutrition* 137(2): 447-452.
5. Khadilkar SS (2013) The emerging role of vitamin D3 in women's health. *J Obstet Gynaecol* 63(3): 147-150.
 6. Contreras Manzano A, Villalpando S, Robledo Pérez R (2017) Vitamin D status by sociodemographic factors and body mass index in Mexican women at reproductive age. *Salud Pública de México* 59(5): 518-525.
 7. El Sagheer GM, Soliman E, Abdulla AM, Ali M (2016) Vitamin D deficiency and pseudofractures in child-bearing Egyptian women: Successful medical treatment helps to avoid fractures and surgical interference. *Open Journal of Endocrine and Metabolic Diseases* 6(8): 183-193.
 8. Robinson PD, Höglér W, Craig ME, Verge CF, Walker JL, et al. (2006) The re-emerging burden of rickets: a decade of experience from Sydney. *Archives of Disease in Childhood* 91(7): 564-568.
 9. Holick MF, Binkley NC, Bischoff Ferrari HA, Gordon CM, Hanley DA, et al. (2011) Evaluation, treatment, and prevention of vitamin D deficiency: an Endocrine Society clinical practice guideline. *The Journal of Clinical Endocrinology & Metabolism* 96(7): 1911-1930.
 10. El Rifai NM, Abdel Moety GA, Gaafar HM, Hamed DA (2014) Vitamin D deficiency in Egyptian mothers and their neonates and possible related factors. *The Journal of Maternal-Fetal & Neonatal Medicine* 27(10): 1064-1068.
 11. Al Mogbel ES (2012) Vitamin D status among adult Saudi females visiting primary health care clinics. *International Journal of Health Sciences* 6(2): 116-126.
 12. Yammine K, Al Adham H (2016) The status of serum vitamin D in the population of the United Arab Emirates. *Eastern Mediterranean Health Journal* 22(9): 682-686.
 13. Cashman KD, Dowling KG, Škrabáková Z, Gonzalez Gross M, Valtueña J, et al. (2016) Vitamin D deficiency in Europe: pandemic?. *The American Journal of Clinical Nutrition* 103(4): 1033-1044.
 14. Holick MF, Chen TC (2008) Vitamin D deficiency: a worldwide problem with health consequences. *The American Journal of Clinical Nutrition* 87(4): 1080S-1086S.
 15. Jain V, Gupta N, Kalaivani M, Jain A, Sinha A, et al. (2011) Vitamin D deficiency in healthy breastfed term infants at 3 months & their mothers in India: seasonal variation & determinants. *The Indian Journal of Medical Research* 133(3): 267-273.
 16. Foo LH, Zhang Q, Zhu K, Ma G, Trube A, et al. (2009) Relationship between vitamin D status, body composition and physical exercise of adolescent girls in Beijing. *Osteoporosis International* 20(3): 417-425.
 17. Woo J, Lam CW, Leung J, Lau WY, Lau E, et al. (2008) Very high rates of vitamin D insufficiency in women of child-bearing age living in Beijing and Hong Kong. *British Journal of Nutrition* 99(6): 1330-1334.
 18. Green TJ, Skeaff CM, Rockell JE, Venn BJ, Lambert A, et al. (2008) Vitamin D status and its association with parathyroid hormone concentrations in women of child-bearing age living in Jakarta and Kuala Lumpur. *European Journal of Clinical Nutrition* 62(3): 373-378.
 19. Laillou A, Wieringa F, Tran TN, Van PT, Le BM, et al. (2013) Hypovitaminosis D and mild hypocalcaemia are highly prevalent among young Vietnamese children and women and related to low dietary intake. *PLoS One* 8(5): e63979.
 20. Holick MF (2006) Resurrection of vitamin D deficiency and rickets. *The Journal of Clinical Investigation* 116(8): 2062-2072.

