

Use of Vitamin D Supplements in Middle East Countries: The Need of the Hour

Nasiruddin Khan^{1*} and Shakira Khatoon²

¹College of Applied and Health Sciences, Department of Food Science and Human Nutrition, A'Sharqiyah University, Sultanate of Oman

²Department of Engineering Chemistry, Model Institute for Engineering and Technology, Jammu (J&K), India

***Corresponding Author:** Nasiruddin Khan, Assistant Professor, College of Applied and Health Sciences, Department of Food Science and Human Nutrition, A'Sharqiyah University, Sultanate of Oman.

Received: June 30, 2018; **Published:** September 10, 2018

Vitamin D, a fat soluble vitamin, commonly known as “sunshine vitamin” is a steroid with hormone like activity. Apart from its established role in human growth and development, it plays a pivotal role in regulating the function of over 200 genes. The major production of vitamin D is through exposure of human skin to direct sunlight. In addition, few dietary intakes that naturally contain vitamin D, includes oily fish such as salmon, mackerel, and herring and oils from fish, including cod liver oil. There are two forms of vitamin D, vitamin D2 (ergocalciferol) and vitamin D3 (cholecalciferol) [1].

The deficiency of vitamin D is a global health problem. For the last few decades, the prevalence of vitamin D deficiency is increasing worldwide [2]. Over a billion people worldwide falls into the category of either vitamin D deficient or insufficient category. Controversy exists regarding the optimum level of serum 25-hydroxyvitamin D in a healthy population. However, vitamin D deficiency is defined as a serum 25(OH)D less than 50 nmol/L; insufficiency is considered at 51 - 75 nmol/L [3]. The deficiency of vitamin D can be a risk factor for several diseases including rickets, growth retardation, muscle weakness, skeletal deformities, hypocalcemia, in children [4] as well as osteomalacia and hip fractures in adults [5]. The association of vitamin D deficiency has also been established with CVD [6] and diabetes mellitus [7].

Despite sufficiently high level of sun shine round the year, the prevalence of vitamin D deficiency is alarmingly high in most of the Middle East countries across all ages, and genders [8,9]. Recent studies performed in Kuwait and Saudi Arabia have demonstrated low levels of 25 (OH)D in young school children (< 25 nmol/L, and < 25-50 nmol/L, respectively) [10,11]. In Sultanate of Oman, the prevalence is as high as 87.5% among participants aged between 18 - 55 years [12]. Similarly, prevalence of vitamin D deficiency (< 37.5 nmol/L) had been reported among healthy adolescent in United Arab Emirates [13].

The increasing trend of low vitamin D status in these countries have been linked to various factors including lack of awareness and understanding, socio-cultural factors, the trend of not fortifying dairy products, and low vitamin D supplementation [14-16].

Dietary supplements are food products containing dietary ingredients aimed to add more nutritional value to a normal diet [17]. Scientific evidences have opened more options to understand the positive and negative effects of dietary supplements use in order to maintain a healthy life [18]. Institute of Medicine (IOM) recommends that infants up to one-year old require 400 IU, and children 1 - 18 years old should receive 600 IU [19]. However, the current recommendations for daily intake of vitamin D are likely to be suboptimal for subjects from Middle East. The rapid pace of vitamin D deficiency prevalence in these countries compel a high dose of vitamin D intake as compared to the recommended level, either from diet or supplements. Recent guidelines for the prevention and treatment of vitamin D deficiency have been put forward by few countries such as Saudi Arabia [20] and UAE [21]. Based on one of these guidelines [21], “Vitamin D supplementation/correction is advised in all persons whose serum 25(OH)D falls below 50 nmol/l (20 ng/ml), and achieving a target of 75 nmol/l (30 ng/ml) is particularly suited for frail, osteoporotic, and older patients”. In an order to minimize the significantly lower baseline vitamin D levels in subjects from the Middle East, these guidelines seem to be justified in recommending high dose above desirable level as compared to western countries.

To achieve any favorable outcomes from supplement use in target individual or population, the care should always be taken for its tolerable upper intake levels, or guidance level [22]. However, there have been several trials in different countries in which high doses of vitamin D were administered without any adverse events [23,24].

The role of vitamin D supplementation has been demonstrated in reducing the risk of type1diabetes in infants and children [25]. In addition, observational studies suggest that vitamin D may be protective against some cancers [25]. A high dose of oral Vitamin D supplementation (1400 - 14000 IU) exhibited favorable effects on musculoskeletal parameters in Lebanese adolescent girls [27]. Similarly, breast feeding mothers supplemented with 6000 IU of vitamin D3 and a prenatal vitamin with 400 IU of vitamin D exhibited neutral toxicity and provided adequate amount of vitamin D to nursing infants [28]. The health effects of Vitamin D supplementation are possibly through its anti-oxidant, anti-inflammatory and immunomodulatory properties [29].

About 80% of the world's population has been reported to use nutritional supplement [30]. However, despite the higher prevalence of micronutrient deficiencies, the use of dietary supplement has been reported to be low in various Middle East countries [31]. To cope with the emerging epidemic of vitamin D deficiency, there is an intense need to modify life style behavior and dietary intakes in these countries.

For the last few years, the continuous efforts from concerned health authorities, researchers and practitioners resulted in an increased demand of nutritional supplements in several part of Middle East countries, indicating a step forward in searching alternatives to solve the issue [32,33]. This trend should progress in coming future with more additional alternative strategies.

Current practices for the prevention of diseases related to vitamin D insufficiency in the general population must include the use of alternative strategies such as changes in lifestyle diet, and exercise. The use of vitamin D supplements should be recommended by all health-care practitioners based on individual need. Moreover, the public health authorities should take the responsibility of increasing the public health awareness and knowledge through various programs and workshops in guiding the appropriate use of supplements. In near future, implementation of new research and evidence-based government policies regarding vitamin D supplementation is an obligation for Middle East countries.

Conflict of Interest

The authors declare no conflict of interest.

Bibliography

1. Lips P. "Vitamin D physiology". *Progress in Biophysics and Molecular Biology* 92 (2010): 4-8.
2. Kumar J., *et al.* "Prevalence and Associations of 25-Hydroxyvitamin D Deficiency in US Children: NHANES 2001-2004". *Pediatrics* 124.3 (2009): e362-e370.
3. Institute of Medicine (IOM) Food and Nutrition Board. Dietary Reference Intakes for Calcium and Vitamin D. National Academy Press, Washington, Washington DC, USA (2011).
4. Holick MF. "Resurrection of vitamin D deficiency and rickets". *Journal of Clinical Investigation* 116.8 (2006): 2062-2072.
5. Lai JK., *et al.* "Hip fracture risk in relation to vitamin D supplementation and serum 25-hydroxyvitamin D levels: a systematic review and meta-analysis of randomised controlled trials and observational studies". *BMC Public Health* 10 (2010): 331.
6. Ford JA., *et al.* "Cardiovascular disease and vitamin D supplementation: trial analysis, systematic review, and meta-analysis". *American Journal of Clinical Nutrition* 100.3 (2014): 746-755.

7. Mitri J., *et al.* "Vitamin D and diabetes". *Endocrinology Metabolism Clinics of North America* 43.1 (2014): 205-232.
8. Arabi A., *et al.* "Hypovitaminosis D in developing countries-prevalence, risk factors and outcomes". *Nature Reviews Endocrinology* 6.10 (2010): 550-561.
9. Bassil D., *et al.* "Hypovitaminosis D in the Middle East and North Africa: prevalence, risk factors and impact on outcomes". *Dermato-endocrinology* 5.2 (2013): 274-298.
10. Khulood OA. "Vitamin D levels in schoolchildren: a cross-sectional study in Kuwait". *BMC Pediatrics* 17.1 (2017): 213.
11. Yousef AS., *et al.* "Vitamin D status in Saudi school children based on knowledge". *BMC Pediatrics* 15 (2015): 53.
12. Abiaka C., *et al.* "Vitamin D status and anthropometric indices of an Omani study population". *Sultan Qaboos University Medical Journal* 13.2 (2013): 224-231.
13. Shamma JM., *et al.* "Vitamin D deficiency among healthy adolescents in Al Ain, United Arab Emirates". *BMC Public Health* 13 (2013): 33.
14. Fahed AC., *et al.* "Diet, genetics, and disease: A focus on the Middle East and North Africa Region". *Journal of Nutrition and Metabolism* (2012): 109037.
15. Al Anouti F., *et al.* "Vitamin D deficiency and sun avoidance among university students at Abu Dhabi, United Arab Emirates". *Dermato-endocrinology* 3.4 (2011): 235-239.
16. Janda M., *et al.* "Knowledge about health benefits of vitamin D in Queensland Australia". *Preventive Medicine* 50.4 (2010): 215-216.
17. DSHEA, Dietary Supplement Health and Education Act of 1994. Pub L No103-417, 108 Stat 4325, 994.
18. Ernst E., *et al.* "The desktop guide to complementary and alternative medicine". 2nd edition. London: Mosby Elsevier (2006).
19. Ross AC., *et al.* "The 2011 report on dietary reference intakes for calcium and vitamin D from the institute of medicine: what clinicians need to know". *Journal of Clinical Endocrinology and Metabolism* 96.1 (2011): 53-58.
20. Al-Daghri NM., *et al.* "Vitamin D status correction in Saudi Arabia: an experts' consensus under the auspices of the European Society for Clinical and Economic Aspects of Osteoporosis, Osteoarthritis, and Musculoskeletal Diseases (ESCEO)". *Archives of Osteoporosis* 12.1 (2017): 1.
21. Haq A., *et al.* "Clinical practice guidelines for vitamin D in the United Arab Emirates". *Journal of Steroid Biochemistry and Molecular Biology* 175 (2018): 4-11.
22. Mason P., *et al.* "One is okay, more is better? Pharmacological aspects and safe limits of nutritional supplements". *Proceedings of the Nutrition Society* 66.4 (2007): 493-507.
23. Nagpal J., *et al.* "A double-blind, randomized, placebo-controlled trial of the short-term effect of vitamin D3 supplementation on insulin sensitivity in apparently healthy, middle-aged, centrally obese men". *Diabetic Medicine* 26.1 (2009): 19-27.
24. Heaney RP., *et al.* "Human serum 25-hydroxycholecalciferol response to extended oral dosing with cholecalciferol". *American Journal of Clinical Nutrition* 77.1 (2003): 204-210.
25. Danescu LG., *et al.* "Vitamin D and diabetes mellitus". *Endocrine* 35.1 (2009): 11-17.
26. Giovannucci E., *et al.* "Prospective study of predictors of vitamin D status and cancer incidence and mortality in men". *Journal of the National Cancer Institute* 98.7 (2006): 451-459.

27. El-Hajj FG., *et al.* "Effect of vitamin D replacement on musculoskeletal parameters in school children: a randomized controlled trial". *Journal of Clinical Endocrinology and Metabolism* 91.2 (2006): 405-412.
28. Wagner CL., *et al.* "High-dose vitamin D3 supplementation in a cohort of breastfeeding mothers and their infants: a 6-month follow-up pilot study". *Breastfeeding Medicine* 1.2 (2006): 59-70.
29. Garcia-Bailo B., *et al.* "Vitamins D, C and E in the prevention of type II diabetes mellitus: modulation of inflammation and oxidative stress". *Biologics* 5 (2011): 7-19.
30. Archer SL., *et al.* "Association of dietary supplement use with specific micronutrient intakes among middle-aged American men and women: the INTERMAP Study". *Journal of the American Dietetic Association* 105.7 (2005): 1106-1114.
31. Allam AR., *et al.* "Nutritional and health status of medical students at a university in Northwestern Saudi Arabia". *Saudi Medical Journal* 33.12 (2012) 1296-1303.
32. GCC pharmaceutical industry report 2013. Dubai, United Arab Emirates: Alpen Capital (2013).
33. Mathew El., *et al.* "Self-reported use of complementary and alternative medicine among the health care consumers at a tertiary care center in Ajman, United Arab Emirates". *Annals of Medical and Health Science Research* 3.2 (2013): 215-219.

Volume 13 Issue 9 September 2018

©All rights reserved by Nasiruddin Khan and Shakira Khatoun.