ajfand SCHOLARLY, PEER REVIEWED
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
Volume 20 No. 3
May 2020
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

GUEST EDITORIAL

Vitamin D deficiency occurs globally including in Africa

Professor Emeritus Susan J Whiting

Professor Emeritus Susan J Whiting
University of Saskatchewan, Canada
Susan.whiting@usask.ca

ajfand SCHOLARLY, PEER REVIEWED AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT Volume 20 No. 3 May 2020 PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST ISSN 1684 5374

Introduction

Vitamin D deficiency is associated not only with bone health but also with non-communicable and infectious diseases such as pneumonia, tuberculosis and bronchiolitis. Many researchers have described the role vitamin D plays in the immune response [1,2] and evidence is emerging as to the role of vitamin D in preventing respiratory conditions [3]. Overall, however, randomized controlled trials (RCTs) have not been definitive enough to provide evidence for vitamin D's roles in these conditions, but criticism is mounting that often these RCTs neglect to study population groups who have vitamin D deficiency [4]. In examining what role vitamin D plays there should be a focus on vulnerable groups.

Extent of the Problem

In 2016 researchers showed a pandemic of vitamin D deficiency in Europe [5]. New data now indicate countries in Africa have joined the rest of the global community in having poor vitamin D [6]. Figure 1 shows that many regions and countries have a large percentage of the population below a serum 25-hydroxyvitamin D concentration of 50 nmol/L. This molecule is the transport form of vitamin D and is the accepted test for status [1]. The main message is that vitamin D deficiency has recently emerged because, like the *Nutrition Transition* to a fast-food eating pattern, we have changed how we obtain vitamin D. In sunny countries fewer people are living a traditional life which had provided enough sun for skin synthesis of vitamin D, for example the pastoral Maasai and hunter-gatherer Hadzabe people are able to maintain their vitamin D levels above 50 nmol/L [7] while those in cities cannot. And in countries far from the equator such as Greenland, young people are no longer eating the traditional foods that provided their ancestors with vitamin D and now only the elders consume foods like seal [8].

The main people at risk in Africa include those living in urban areas, women, and new-born infants [6]. Cited in that systematic review of vitamin D in Africa are several studies conducted by graduate students at Hawassa University in Ethiopia. They showed that urban children had poorer vitamin D status than rural children [9] and that even rural women had low levels despite being outdoors during most of the day [10]. Given the concern about low vitamin D status in vulnerable groups within Africa, it is important to heed the advice of those who reported deficiency in Africa: "strategies to prevent, detect, and treat vitamin D deficiency need to be incorporated into public health and primary care in Africa" [6].

Conclusion

There are strategies to target vitamin D deficiency and its accompanying diseases. Bouillon has issued a call to address rickets by mandating vitamin D supplementation of infants [11]. Uday and Högler [12] cast an important spotlight on osteomalacia, which goes undiagnosed around the world, and they provide practical means of testing for it. Improving vitamin D status through sun exposure is complex as sun exposure guidance focusses on avoidance and working indoors is a reality for many [13]. In the absence of fortification, food sources of vitamin D are few [14]. While fortification is an important strategy, many factors such as choosing the appropriate food vehicles need careful consideration and should match the dietary pattern of those needing to consume them

ajfand SCHOLARLY, PEER REVIEWED
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
Volume 20 No. 3
May 2020
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

[15]. Despite theses obstacles we need to remain mindful of the role vitamin D plays in reduction of risk of both infectious diseases and chronic non-communicable diseases [1-3] and act more quickly to solve the issue of vitamin D deficiency. Recognizing there is a problem that vitamin D deficiency is harmful to the health of their citizens is the first step countries should take.

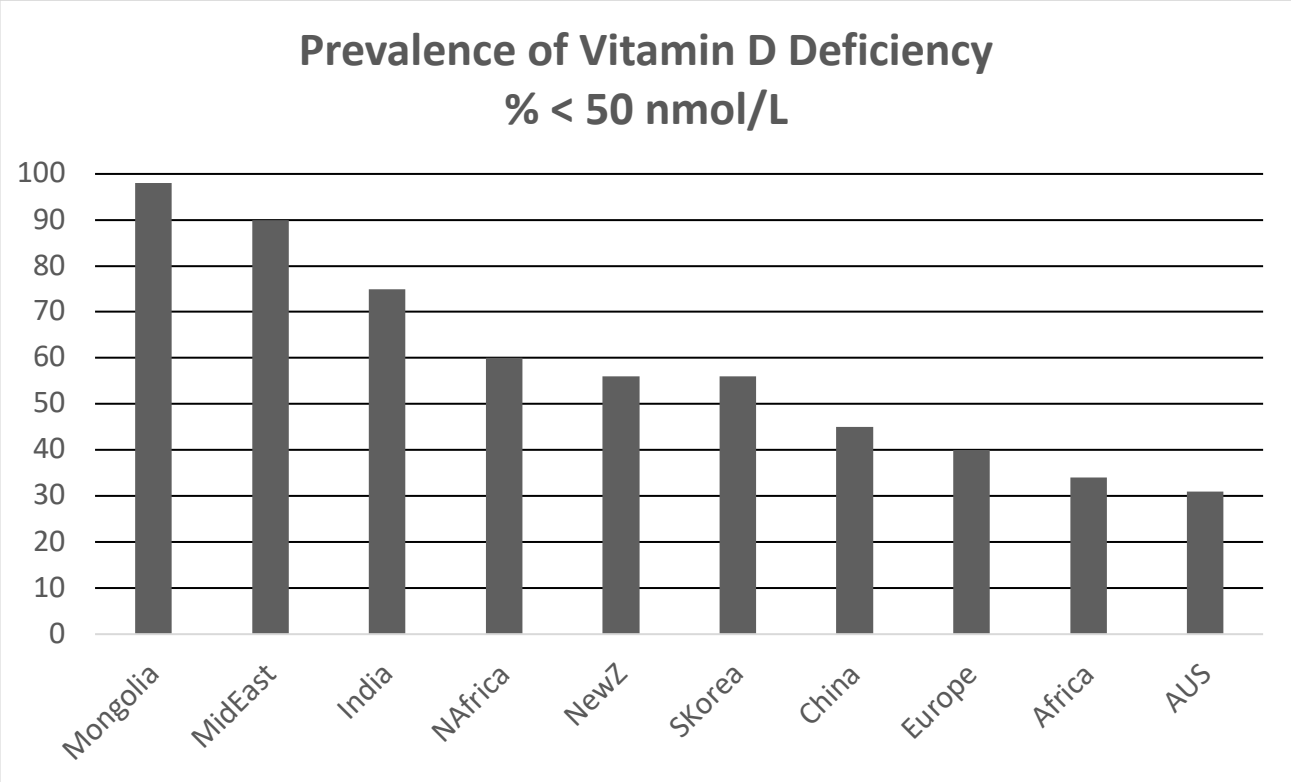

Figure 1: Reported incidence of vitamin D deficiency defined as a 25-hydroxyvitamin D <50 nmol/L around the globe including Australia (AUS), China, Europe, India, South Korea (SKorea), Middle East (MidEast), Mongolia, New Zealand (NewZ), North Africa (NAfrica), and Africa. From Wacker and Holick [1] and Mogire *et al.* [6]

REFERENCES

1. **Wacker M and MF Holick** Vitamin D - effects on skeletal and extraskeletal health and the need for supplementation. *Nutrients 2013*; **5:** 111-148.

2. **Liu PT, Stenger S, Li H, Wenzel L, Tan BH, Krutzik SR, Ochoa MT, Schauber J, Wu K, Meinken C, Kamen DL, Wagner M, Bals R, Steinmeyer A, Zügel U, Gallo RL, Eisenberg D, Hewison M, Hollis BW, Adams JS, Bloom BR and RL Modlin** Toll-like receptor triggering of a vitamin D-mediated human antimicrobial response. *Science 2006*;**311(5768**):1770-1773.

3. **Martineau AR, Jolliffe DA, Hooper RL, Greenberg L, Aloia JF, Bergman P, Dubnov-Raz G, Esposito S, Ganmaa D, Ginde AA, Goodall EC, Grant CC, Griffiths CJ, Janssens W, Laaksi I, Manaseki-Holland S, Mauger D, Murdoch DR, Neale R, Rees JR, Simpson S Jr, Stelmach I, Kumar GT, Urashima M and CA Camargo** Vitamin D supplementation to prevent acute respiratory tract infections: systematic review and meta-analysis of individual participant data. *Br Med J 2017* **356:**i6583.

4. **Rejnmark L, Bislev LS, Cashman KD, Eiríksdottir G, Gaksch M, Grübler M, Grimnes G, Gudnason V, Lips P, Pilz S, van Schoor NM, Kiely M and R Jorde** Non-skeletal health effects of vitamin D supplementation: A systematic review on findings from meta-analyses summarizing trial data. *PLoS One 2017*; **12**:e0180512.

5. **Cashman KD, Dowling KG, Škrabáková Z, Gonzalez-Gross M, Valtueña J, De Henauw S, Moreno L, Damsgaard CT, Michaelsen KF, Mølgaard C, Jorde R, Grimnes G,Moschonis G, Mavrogianni C, Manios Y, Thamm M, Mensink GB, Rabenberg M, Busch MA, Cox L, Meadows S, Goldberg G, Prentice A, Dekker JM, Nijpels G, Pilz S, Swart KM, van Schoor NM, Lips P, Eiriksdottir G, Gudnason V, Cotch MF, Koskinen S, Lamberg-Allardt C, Durazo-Arvizu RA, Sempos CT and M Kiely** Vitamin D deficiency in Europe: pandemic? *Am J Clin Nutr 2016*;**103(4):**1033-1044.

6. **Mogire RM, Mutua A, Kimita W, Kamau A, Bejon P, Pettifor JM, Adeyemo A,Williams TN and SH Atkinson** Prevalence of vitamin D deficiency in Africa: a systematic review and meta-analysis. *Lancet Global Hlth 2020*;**8:**e134-e142.

7. **Luxwolda MF, Kuipers RS, Kema IP, Dijck-Brouwer DA, and FA Muskiet**. Traditionally living populations in East Africa have a mean serum 25-hydroxyvitamin D concentration of 115 nmol/l. *Br J Nutr 2012*; **108(9):**1557-1561

8. **Nielsen NO, Jørgensen ME, Friis H, Melbye M, Soborg B, Jeppesen C, Lundqvist M, Cohen A, Hougaard DM and P Bjerregaard** Decrease in vitamin D status in the Greenlandic adult population from 1987-2010. *PLoS One 2014*; **9(12)**:e112949.

9. **Wakayo T, Belachew T, Vatanparast H and SJ Whiting** Vitamin D status and its predictors among urban and rural school children in Ethiopia. *Plos ONE 2015*; **10(3):**e0120963.

10. **Gebreegziabher T and BJ Stoecker** Vitamin D insufficiency in a sunshine-sufficient area: southern Ethiopia. *Food Nutr Bull 2013*;**34(4):**429-433.

11. **Bouillon R** Comparative analysis of nutritional guidelines for vitamin D. *Nat Rev Endocrinol 2017*; **13(8)**:466-479.

12. **Uday S and W Högler** Spot the silent sufferers: A call for clinical diagnostic criteria for solar and nutritional osteomalacia. *J Ster Biochem Molec Biol 2019*;**188**:141-146.

13. **Islam MZ, Shamim AA, Kemi V, Nevanlinna A, Akhtaruzzaman M, Laaksonen M, Jehan AH, Jahan K, Khan HU, C Lamberg-Allardt** (2008). Vitamin D deficiency and low bone status in adult female garment factory workers in Bangladesh. *Br J Nutr 2008*;**99(6):**1322-1329.

14. **Calvo MS, Whiting SJ and CN Barton** Vitamin D intake: A global perspective of current status. *J Nutr 2005*;**135**:310-316.

15. **Cashman KD and R O'Dea** Exploration of strategic food vehicles for vitamin D fortification in low/lower-middle income countries. *J Ster Biochem Molec Biol 2019*; **195**:105479.