www.jnsd.tums.ac.ir

Editorial Open Access

Vitamin D requirements during pregnancy: A new day

Bruce W Hollis

Professor of Pediatrics, Biochemistry and Molecular Biology, Director of Pediatric Nutritional Sciences
Medical University of South Carolina, USA, Email: hollisb@musc.edu

For decades, vitamin D has been recognized only for its ability to correct skeletal abnormalities. This point is made clear by recent recommendations by the Institute of Medicine (IOM). This organization has only recognized vitamin D to have a role in skeletal homeostasis and thus recommended a minimal amount, 400-600 IU/d [1]. Part of the problem here is that vitamin D has long been thought to be a teratogenic substance and thus feared by the obstetrics community [2]. However, these fears are no longer valid and vitamin D not only is not a teratogen, significant amounts are required during pregnancy to avert a wide range of problems including complications of birth, preeclampsia, gestational diabetes, neurodevelopment and asthma incidence in the newborn child [3-4]. Surely more roles of vitamin D will be uncovered in the future in the area of autoimmune function involving type 1 diabetes and multiple sclerosis. How does vitamin D alter all these systems in_utero? Our research tell us that this is occurring through epigenetic gene alteration and we are just now starting to understand the processes involved which predominately include inflammation and immune function [8]. It is heartening to see countries like Iran involved in this area of clinical research [6].

How much vitamin D does our group recommend during pregnancy? Our evidence tells us that 4,000 IU/d vitamin D_3 is required and this should begin preconception. We base this recommendation on the amount of vitamin D required to maintain a circulating 25(OH)D levels of 40 ng/ml, the level at which the conversion of 25(OH)D to $1,25(OH)_2D$ is optimized [3]. If a woman, following delivery, chooses to breast feed her infant she should take a supplement of 6,000 IU/d vitamin D_3 [9]. This amount will ensure adequate vitamin D in her milk to supply her nursing infant with all the vitamin D that the infant requires. These vitamin D intakes in Muslim countries are vitally important because of clothing practices which prohibit any significant vitamin D_3 production due to lack of exposed skin to the sun.

References

1. Ross AC, Manjon JE, Abrams SA, Brannon PM, Clinton SK, Durazo-Arvizu RA, et al. The 2011 dietary reference intakes for calcium and vitamin D: What dietetic practitioners need to know. J Amer Dietetic Assoc. 2011: 111(4): 524-7.
2. Friedman WF. Vitamin D as a cause of the supra valvular aortic stenosis syndrome. Amer Heart J. 1967: 73: 718-20.
3. Hollis BW, Johnson D, Hulsey TC, Ebeling M, Wagner CL. Vitamin D supplementation during pregnancy: double-blind, randomized clinical trial of safety and effectiveness. J Bone Mineral Res. 2011: 26(10): 2341-57.
4. Sablok A, Batra A, Thariani K, Batra A, Bharti R, Aggarwal AR, et al. Supplementation of vitamin D in pregnancy and its correlation with fetal-maternal outcome. Clin Endocrinol. 2015: 83(4): 536-41.
5. Litonjua AA, Carey VJ, Laranjo N, Harshfield BJ, McElrath TF, O'Conner GT, et al. Effect of prenatal supplementation with vitamin D on asthma or recurrent wheezing in offspring by age

3 years: The VDAART randomized clinical trial. JAMA. 2016: 315(4): 362-70.
6. Mojibian M, Soheilykbah S, Fallah Zadeh MA, Jannati Moghadam M. The effects of vitamin D supplementation on maternal and neonatal outcome: A randomized clinical trial. Iran J Reprod Med. 2015: 13(11): 687-96.
7. Hollis BW, Wagner CL. Vitamin D and pregnancy: Skeletal effects, non-skeletal effects, and birth outcomes. Calcif Tiss Internat. 2013: 92(2): 128-39.
8. Szymczak I, Pawliczak R. The active metabolite of vitamin D_3 as a potential immunomodulator. Scand J Immunol. 2016: 83(2): 83-91.
9. Hollis BW, Wagner CL, Howard CR, Ebeling M, Shary JR, Smith PG, et al. Maternal versus infant vitamin D supplementation during lactation: A randomized controlled trial. Pediatrics. 2015: 136(4): 625-34.