Original Article

Vitamin D deficiency in outpatient department:Eastern Province of KSA experience

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ABSTRACT

Objective

To determine the level of vitamin D3 in patients attending out patient department with aches and pains.

Methodology

This cross-sectional study was carried out at Imam Abdulrahman bin Faisal hospital, National Guard health affairs, Dammam, Eastern Province, Kingdom of Saudi Arabia from August 2008 to July 2009. All the adult patients attending outpatient with aches and pains had their Vitamin D3 blood level done.

Results

A total of 1000 patients were studied; 766 (76.6%) were females and 244 (24.4%) were males. 744 (97.12%) females and 242 (99.18%) males were found to be deficient in Vitamin D3 in serum.

Conclusion

There is an increase need for patients and health care professionals to understand the preventive aspects of this vitamin that acts more like a hormone. There is a need for increased vitamin D supplementation across the lifespan. The role of vitamin D3 in aches and pain need more detailed research, until proved otherwise it can be presumed that it has a definite role in aches and pains. (Rawal Med J 2010;35:).

Key words

Vitamin D3, aches and pains, vitamin D deficiency.

INTRODUCTION

There may be a strong relationship between lower rates of vitamin D3 in blood and a variety of chronic diseases.[1] An objective review is still necessary for the clinician to separate fact from fiction regarding this specific vitamin.[2] Vitamin D deficiency has negative effects across the lifespan.[3] Vitamin D is a fat-soluble vitamin that is metabolized by the body by either sun (ultraviolet light) exposure or dietary intake and its metabolism is well understood.[4,5] Both vitamin D from the sun and diet enter the liver and are converted to 25-hydroxyvitamin D [25(OH)D_3] (calcidiol).[5] The calcidiol is the major circulating form of vitamin D and is used to determine vitamin D status. To become biologically active, it requires additional hydroxylation in the kidneys to form active 1, 25-hydroxyvitamin D [1, 25(OH) 2$D_]$ (calcitriol); however, 1,25$(OH)_2$D is not used to determine vitamin D status because it circulates at 1000 times less concentration than 25(OH)D_3 and it has a half life of 6 hours in comparison to 2 weeks for 25(OH)$D_{3.}$[5] Various factors that can cause vitamin D deficiency.[6- 8]

Recent studies suggest that the regular intake of vitamin D may increase blood levels greater than weekly or monthly oral intakes of equivalent doses.[9] Sunscreen has the ability to block ultraviolet B (UVB) light. However, no clinician should recommend trading one condition for another, and it is a concern that some clinicians advise regular sun exposure several times a week.[10] The aim of this study was to determine the level of vitamin D3 in patients attending our out patient department with aches and pains

METHODOLOGY

This cross-sectional study was carried out at the department of surgery, orthopaedic unit. Imam Abdulrahman bin Faisal hospital, National Guard Health Affairs, Dammam, Eastern Province, Kingdom of Saudi Arabia, from August 2008 to July 2009. All adult subjects who presented at orthpaedic clinic during the study period with unexplained aches and pains were included in the study.

Subjects who had known reasons for pain were excluded from study. All subjects were formally explained in detail about the test.

Table 1. A partial list of foods that are naturally contain vitamin D.

FOOD	SERVING	VITAMIN D (IU)
SALMON (WILD)	3 OZ	1000
SALMON (FARMED)	3 OZ	275
TUNA(BLUE FIN)	3 OZ	170
TUNA(CANNED IN WATER)	3OZ	135
SHRIMP	3OZ	120
COD	3OZ	80
MILK	1 CUP	100
EGG (WHOLE)	1	25
MUSHROOMS	2OZ	50
COD LIVER OIL	1 TEASPOON FUL	450

All samples were analyzed by same analyzer and staff. Once enrolled for the study, a complete history and detail clinical examination was performed in all patients and other relevant investigation were done. The chi-square was applied to evaluate statistical significance of the study variables on SPSS version 10.

RESULTS

A total of 1000 patients were investigated in a period of 12 months. Out of these, 766(76.6%) were females and 244(24.4%) were males. Vitamin D3 deficiency was found in 744(97.12%) females and 242(99.18%) males. All were deficient of Vitamin D2 also.

Table 2. Effect of Cooking on Vitamin D Content in Farmed Salmon.[26]

Cooking Style	IU of Vitamin D per 3.5 oz. Serving
Raw	275
Micro waved	272
Baked	248
Fried	142

The level of Vitamin D3 our lab is using are Deficiency = < 20 ng/ml, Insufficiency = 20 – 29 nm/ml, sufficiency = > 30 ng/ml and toxicity = > 100 ng/ml.

DISCUSSION

Vitamin D3 deficiency disrupts phosphorus and calcium homeostasis, causing disruption in neuromuscular function, muscle strength, cancer, diabetes, bone mineralization and inflammatory illnesses.[11] Autoimmune diseases such as inflammatory bowel diseases (Crohns disease and ulcerative colitis)[12] many cardiovascular dicorders[13] breast and colorectal cancer[14,15]have relationships with vitamin D. According to the National Institutes of Health (NIH) USA, 10 to 15 minutes of direct sunlight at least twice a week to the face, arms, hands, or back is sufficient to maintain optimum serum Vitamin D levels. [16,17] Due to the damaging effects of UVB radiation from artificial sources, it is not recommended that people use these devices as a main source of vitamin D.[18]

Table 3. Medications That Prevent Vitamin D Absorption.

Anticonvulsants: (phenytoin, carbamazepine, Phenobarbital), Thiazide diuretics, Cimetidine ,Corticosteroids, Heparin, Nicotine
Cholesterol-lowering medications: (Cholestyramine, colestipol, ezetimibe)
Diet agents (xenical, Alli)

According to recent research and recommendations from vitamin D experts, ideal serum levels are between 30 and 60 ng/ml. Unfortunately, higher does not mean better. In fact, it has been suggested that long-term significant increases in vitamin D could be detrimental. The only foods that naturally contain vitamin D are seafood, mushrooms, and egg yolks (Table 1).[19] The only cooking style that affected vitamin D content was frying in vegetable oil, which significantly reduced the vitamin D content (Table 2).

A meta analysis of 25 trials involving postmenopausal women showed that vitamin D supplementation (300-2000 IU daily) reduced the risk of vertebral fracture.[20] There are multiple drugs prescribed on a regular basis in primary care that can inhibit the absorption of vitamin D and include anticonvulsants, thiazide diuretics, corticosteroids, nicotine, cimetidine, cholesterol-lowering agents (ezetimibe), heparin, and diet agents (Table 3).

CONCLUSION

We found a very high level of vitamin D deficiency in our study. Part of this deficiency may lie in health care professional advice, disease-specific education being followed and the aggressive promotion of sun avoidance for better skin health. There should also be ample time given to the various proven methods of raising vitamin D levels, including fish consumption and vitamin D supplementation.

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REFERENCES

1. Khazai N, Judd SE, Tangpricha V. Calcium and vitamin D. Current Rheumatology Reports 2008;10:110-17.

2. Coen G. Vitamin D. J Nephrol 2008;21:313-23.

3. Holick MF. VitaminD deficiency. N Engl J Med 2007;357:266-81.

4. Giese KK. Do your patients have vitamin D deficiency? Clin Advisor 2007; 10:70-75.

5. Holick MF. The role of vitamin D for bone health and fracture prevention. Current osteoporosis Rep 2006;4:96-102.

6. Wolpowitz D, Gilchrest BA. The vitamin D questions, How much do you need and how should you get it? J Am Acad Dermatol 2006;54:301-17.

7. Aasheim ET, Hofso D, Hjelmesaeth J, Birkeland KI, Bohmer T. Vitamin status in morbidly obese patients. Am J Clin Nutr 2008;87:362-69.

8. Perez Castrillon JL, Abad L, Vega G, Sanz Cantalapiedra A, Garcia-Porrero M, Pinacho F, et al. Effect of atorvastatin on bone mineral density in patients with acute coronary syndrome. Eur Rev Med Pharmacol Sci 2008;12:83-88.

9. Chel V, Wijnhoven HAH, Smit JH, Ooms M, Lips P. Efficacy of different doses and Time intervals of oral vitamin D supplementation with or without calcium in elderly Nursing Home residents. Osteoporosis Intern 2008;19:663-71.

10. Jacobs ET, Alberts DS, Foote JA, Green SB, Hollis BW, Yu Z, et al. VitaminD insufficiency in southern Arizona. Am J Clin Nutr 2008;87:608-13.

11. Pittas AG, Lau J, Hu FB. Review, The role of vitamin D and calcium In type 2diabetes. Clin Endocrinal Metab 2007;92:2017-29.

12. Cooper C, Javiad K, Westlake S. Developmental origins of osteoporotic fracture. J Nutr 2005;135:S2728-S2735.

13. Luong KVQ, Nguyen LTH. Vitamin D and cardiovascular disease. Curr Med chem 2006;13:2443-47.

14. Lappe JM, Travers-Gustafason D, Davies KM. Vitamin D and Calcium supplementation reduces cancer risk. Am J Clin Nutr 2007;85:1586-91.

15. Dembrow M. High vitamin D for cancer prevention? Clin Advisor 2007;10:54-57.

16. Matsuoka LY, Ide L, Wortsmen J. Sunscreen suppress cutaneous Vitamin D3 synthesis. Clin Endocrinal Metab1987;64:1165-68.

17. Robinson JK. Sun exposure, sun protection and Vitamin D. JAMA 2005;294:1541-45.

18. Lim HW. Sunlight, tanning booths, and vitamin D. J Acad Dermatol 2005;52:868-76.

19. Chen TC, Chimeh F, Lu Z, Mathieu J, Person KS, Zhang A, et al. Factors that Influence the cutaneous synthesis and dietary sources of vitamin D. Arch Biochem Bioph 2007;460:213-17.

20. Khosla S, Melton LJ. Osteopenia. New Engl J Med 2007;356:2293-00.