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Vitamin D deficiency and chronic low back pain

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Abstract

Low back pain, a leading cause of disability, A number of studies have been done to assess the vitamin D status in subjects with nonspecific back pain where no organic cause could be ascertained.

Patients and method: All Patients of either gender, aged 18 – 75 years with chronic lower back pain for ≥ 6 weeks, attending Baqoba general hospital were included. The study period extend from January 2010 to January 2018.For all a blood sample were withdrawn to measure biochemical profile, vitamin D 3 level, and parathyroid hormone.

Results: 321 patients were collected and 260 control were included in the study. There were a wide spread vitamin D deficiency in both patients and control, with no statistical difference exist between patients and control in the level of vitamin D, or other biochemical profiles

Discussions and Conclusions: Our results indicate that there is no relationship between vitamin D level and chronic back pain, these results are consistent with most recent trials that indicated that no effect of the level of vitamin D and chronic back pain.
National wide study to establish the normal range of vitamin D is needed as there is wide racial difference in the level of vitamin D

Keywords: Low back pain, vitamin D, biochemical profile.

Introduction

Low back pain, a leading cause of disability, interferes with quality of life and work performance and is the most common reason for medical consultations [1]. It is a very commonly attributed to the upright posture and many hours spent sitting, at work. Low back pain could result in an enormous socio-economic burden. In up to 80 % of patients with low back pain, a precise anatomic cause cannot be localized [2].

A number of studies have been done to assess the vitamin D status in subjects with nonspecific back pain where no organic cause could be ascertained. The results have largely been contradictory. A meta-analysis of 22 studies found no statistically significant link between vitamin D levels and chronic pain syndromes. However some studies hint towards a cause effect relationship between vitamin D levels and pain [3, 4].

Patients and Methods

All Patients of either gender , aged 18 – 75 years with chronic lower back pain for ≥ 6 weeks, attending Baqoba general hospital were included. The study period extend from January 2010 to January 2018.

Exclusion Criteria Patients were excluded if they had evidence of other causes for neuropathy and painful conditions like diabetes mellitus; rheumatoid arthritis; symptomatic osteoarthritis of the hip, knee, and ankle;

epilepsy; psychiatric diseases and substance abuse; metabolic bone disease (hypo- or hyperparathyroidism); chronic renal disease, medical or surgical disorders affecting vitamin D metabolism (gastric surgery, chronic liver disease, renal failure, intestinal malabsorption, systemic infection, cancers etc.). Patients consuming drugs altering bone metabolism like corticosteroid or bisphosphonates and pregnant and lactating mothers and women intending pregnancy were also excluded. Patients taking vitamin D supplements during past 3 months were also excluded from the present study.

A control group was selected from healthy next of kin attending the hospital.

For all a blood sample were withdrawn to measure biochemical profile, vitamin D 3 level, and parathyroid hormone.

According to the level of 25-OHD, vitamin D deficiency was defined as a 25-OHD level of ≤ 20 ng/mL and vitamin D insufficiency as 21 to 29 ng/mL, and normal level as above 30 ng/mL (5,6,7,8).

Statistical analyses were done using SPSS19 for Windows.

Results

Finally 321 patients were collected and 260 control. The mean age +/-2SD for patients were 41+/-14.7.The mean age +/-2SD for control were41+/-14.8.The demographical characters are presented in table 1. Biochemical profiles are presented in table 2. Vitamin D level sufficiency or deficiency is presented in table 3.

Table 1: Patients' and control demographic parameters

	Patients	control	P value
Age	41+/-14.7	41+/-14.8	0.7
Sex F/M%	68.91%	70%	0.5
Sex female	215	140	
Sex male	106	60	
BMI	36.7+/-17.9	34.5+/-18.1	0.4

Table 2: biochemical profile

	Patients	Control	P-value
S.calicium(mg/dl)	9.5+/-1.1	9.5+/-1.2	0.43
Alk. Phosph.(iu/l)	90.7+/-31	89.9+/-32	0.27
Parathyroid hormone (pg/mL)	35.5+/-13.3	35.4+/-13.5	0.46
S.Vit.D3	17.8+/-7.8	17.9+/-7.7	0.17

Table 3: vitamin D 3 level

	Patients	Control	P-value
Normal (above 30 ng/mL)	7(2.18%)	4(2%)	0.32
Insufficiency (21 to 29 ng/mL)	69(21.5%)	40(20%)	0.14
Deficiency (=<20ng/mL)	245(75.32%)	156(78%)	0.12

All biochemical profiles were similar between patients and control.

There were a wide spread vitamin D deficiency in both patients and control, with no statistical difference exist between patients and control in the level of vitamin D, or other biochemical profiles.

Discussion and Conclusions

The optimal serum 25(OH)D concentration for skeletal health and extraskeletal health is controversial, and it has not been rigorously established for the population in general or for specific ethnic groups. Black Americans have lower fracture risk and higher bone density than other races. There is very little evidence about effects of vitamin D (or calcium supplementation) in persons who are not Caucasian, but since racial differences in mineral metabolism are substantial, we cannot apply findings from one race to other races. (8-17).

A recent review of 22 relevant studies found no convincing link between prevalence and latitude and no association between serum levels of 25-OH vitamin D in chronic pain patients and controls. Interestingly, though, there was a contrast in treatment effects between randomized, double-blind trials that minimized bias and those with studies known to be subject to bias. In those that blinded the vitamin D therapy, only 10% of patients were in trials showing a benefit of vitamin D treatment, whereas among those who did not blind the treatment 93% were in trials showing a benefit of vitamin D supplementation.(18).

Our results indicate that there is no relationship between vitamin D level and chronic back pain, these results are consistent with most recent trials that indicated that no effect of the level of vitamin D and chronic back pain.
National wide study to establish the normal range of vitamin D is needed as there is wide racial difference in the level of vitamin D, for example blacks maintain higher BMD and lower skeletal fracture risk than whites despite lower 25(OH)D concentrations and higher PTH concentrations [19-21], and Mexican-Americans manifest similar though less pronounced differences compared to non-Hispanic whites [21-23]. These observations suggest that vitamin D ranges considered optimal for bone and mineral metabolism among whites may not be the same as those among blacks and Hispanics [25].

References

1. Ehrlich GE. Low back pain. Bull World Health Organ. 2003; 81:671–6.
2. Deyo RA, Rainville J, Kent DL. What cam the history and physical examination tell us about low back pain.JAMA. 1992;268:760–5.
3. Straube S, Andrew Moore R, McQuay HJ. Vitamin D and chronic pain.Pain. 2009;141:10–3.
4. Kulie T, Groff A, Redmer J, Hounshell J, Schrager S. Vitamin D: an evidence-based review. J Am Board Fam Med. 2009;22: 698–706.
5. Kim TH, Lee BH, Lee HM, Lee SH, Park JO, Kim HS, Kim SW, Moon SH. Prevalence of vitamin D deficiency in patients with lumbar spinal stenosis and its relationship with pain. Pain Physician 2013; 16:165-176. 25.
6. Plotnikoff GA, Quigley JM. Prevalence of severe hypovitaminosis D in patients with persistent, nonspecific musculoskeletal pain. Mayo ClinProc 2003; 78:1463-1470. 26. 7.Holick MF, Garabedian M. Vitamin D: photobiology, metabolism, mechanism of action, and clinical applications. In: Favus MJ (ed). Primer on the Metabolic Bone Diseases and Disorders of Mineral Metabolism. 6th ed. American Society for Bone and Mineral Research, Washington, DC, 2006, pp 129-137. 8. Zhang R, Naughton DP. Vitamin D in health and disease: Current perspectives. Nutr J 2010; 9:65. 28. Muir SW, Montero-Odasso M. Effect of vitamin D supplementation on muscle strength, gait and balance in older adults: A systematic review and meta-analysis. J Am GeriatrSoc 2011; 59:2291-2300
9. Bouillon R, Van Schoor NM, Gielen E, et al. Optimal vitamin D status: a critical analysis on the basis of evidence-based medicine. J ClinEndocrinolMetab 2013; 98:E1283.
10. Need AG, O'Loughlin PD, Morris HA, et al. Vitamin D metabolites and calcium absorption in severe vitamin D deficiency. J Bone Miner Res 2008; 23:1859.
11. Lips P. Vitamin D deficiency and secondary hyperparathyroidism in the elderly: consequences for bone loss and fractures and therapeutic implications. Endocr Rev 2001; 22:477.
12. Cauley JA, Lui LY, Ensrud KE, et al. Bone mineral density and the risk of incident nonspinal fractures in black and white women. JAMA 2005; 293:2102.
13. Hannan MT, Litman HJ, Araujo AB, et al. Serum 25-hydroxyvitamin D and bone mineral density in a racially and ethnically diverse group of men. J ClinEndocrinolMetab 2008; 93:40.
14. Powe CE, Evans MK, Wenger J, et al. Vitamin D-binding protein and vitamin D status of black Americans and white Americans. N Engl J Med 2013; 369:1991.
15. Nielson CM, Jones KS, Bouillon R, et al. Role of Assay Type in Determining Free 25-Hydroxyvitamin D Levels in Diverse Populations. N Engl J Med 2016; 374:1695.

16. Gallagher JC, Jindal PS, Smith LM. Vitamin D does not increase calcium absorption in young women: a randomized clinical trial. J Bone Miner Res 2014; 29:1081.
17. Gallagher JC, Jindal PS, Smith LM. Vitamin D supplementation in young White and African American women. J Bone Miner Res 2014; 29:173.
18. Straube S, Andrew Moore R, McQuay HJ. Vitamin D and chronic pain. Pain 2009;141:10 –3.
19. Barrett-Connor E, Siris ES, Wehren LE, Miller PD, Abbott TA, Berger ML, Santora AC, Sherwood LM. Osteoporosis and fracture risk in women of different ethnic groups. J Bone Miner Res. 2005;20:185–194.
20. Nelson DA, Jacobsen G, Barondess DA, Parfitt AM. Ethnic differences in regional bone density, hip axis length, and lifestyle variables among healthy black and white men. J Bone Miner Res. 1995;10:782–787.
21. Aloia JF, Vaswani A, Ma R, Flaster E. Comparison of body composition in black and white premenopausal women. J Lab Clin Med. 1997;129:294–299.
22. Hannan MT, Litman HJ, Araujo AB, McLennan CE, McLean RR, McKinlay JB, Chen TC, Holick MF. Serum 25-hydroxyvitamin D and bone mineral density in a racially and ethnically diverse group of men. J ClinEndocrinolMetab. 2008;93:40–46.
23. Leder BZ, Araujo AB, Travison TG, McKinlay JB. Racial and ethnic differences in bone turnover markers in men. J ClinEndocrinolMetab. 2007;92:3453–3457.
24. Bauer RL, Diehl AK, Barton SA, Brender J, Deyo RA. Risk of postmenopausal hip fracture in Mexican American women. Am J Public Health. 1986;76:1020–1021.
25. Aloia JF. African Americans, 25-hydroxyvitamin D, and osteoporosis: a paradox. Am J ClinNutr. 2008;88:545S–550S.

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