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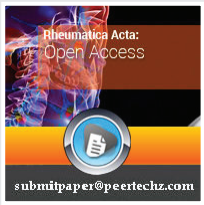

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Research Article

Serum 25 Hydroxy – D in Patients without Vitamin D Supplementation: Perspectives from Cohorts with Rheumatoid Arthritis and Systemic Lupus Erythematosus

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Abstract

Hypovitaminosis D is common in the sunny UAE. This study focusses on the perspectives of 25 hydroxy-D in patients with RA and others with SLE ((Autoimmune disease, ADs)) and to compare them to others of patients without ADs) .The latter were used as control group. All included individuals were without history of vitamin D intake. Hypovitaminosis D was common in the 3 groups (RA, SLE and controls). However, the prevalence of hypovitaminosis D in patients with each of ADs was significantly lower to that of the control group yet with higher means of 25 (OH) D levels. These findings were in contrast to those of number of regional and international studies conducted earlier. Data on the high prevalence of hypovitaminosis D and the low mean values of 25 (OH) D were comparable between the two groups of ADs.

Overall, the results of this study may lead to some controversy or perhaps a challenge to the widespread understanding of the contrary as per previous international and regional studies. They also argue further the concept of specific association of hypovitaminosis D and autoimmune disease and certainly encourage wider estimation of 25(OH) D among larger numbers of patients in general medical practice. Finally, the outcomes of this work deserve further study/ies in larger groups in the future.

Introduction

Vitamin D has a crucial role in the functioning of the immune system and shown to be an immunomodulator in various molecular studies. Thus, maintaining normal levels of vitamin D is important in patients with autoimmune diseases. Vitamin D deficiency was found to be common in patients with these conditions (AIDs) in several studies and seemed to affect the activity and outcomes in some of those patients [1,2]. In UAE despite the year-long ample sunshine, hypovitaminosis D (deficiency and insufficiency) is widely prevalent and no less than 80% of individuals screened previously for the 25 (OH) had hypovitaminosis D [3-6].

Objective

This study was designed, to explore some perspectives of 25 (OH) D in 3 cohorts of patients with ((rheumatoid because (RA), systemic lupus erythematosus (SLE) and compare the findings to others with non-autoimmune disease)). All were without a history of vitamin D intake. To the best of our knowledge, it would be the first of its kind in this region.

Methods

35 adults with the diagnosis of established RA [7,8] and 26 with SLE [9] were compared to other 77 patients without AIDs.The latter was used as control group. They included degenerative spinal disease, OA, metabolic disorders, gout, respiratory disorders, anemias, hypertension, ischemic

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heart disease, and osteoporosis. All were without a history of vitamin D supplementation. They underwent 25 (OH) D assay by chemiluminescent microparticle immune- assay, Abbot diagnostics (insufficiency < 30 ng/ml, deficiency < 10 ngl). Data of parathyroid hormone (PTH) (N = 15-65 pg/ml) and total calcium (tCa) (N = 8.6 - 10 mg/dl) were also sought. Patients with a history of liver or, renal failure, malabsorption, and intake of corticosteroids and anticonvulsants were excluded.

In the ethical part, all patients were informed that the result of the vitamin D assay would be the tool for treatment with vitamin D supplementation if ever required, and the results would also be published for scientific purposes. All signed the official paper designated for that purpose before the blood extraction for the assay.

Results

The 3 groups were dominated by female gender. Individuals from Arab countries formed the majority of the subjects (63%, 64.5%, and 63.5% respectively, P = NS). The average age was not different also (45 ± 9.87, 42.1 ± 11.8, and 41.5 ± 12.8 years respectively, P = NS). Table 1 shows the data and the comparison of the three groups. Hypovitaminosis D was a common finding in the three groups. However, that was significantly more common in the control group compared to each of the autoimmune disorders. Patients with RA and SLE nonetheless, expressed comparable frequency of hypovitaminosis D. Secondary hyperparathyroidism was observed in comparable frequency in all groups with hypovitaminosis D (Table 2).

Discussion

The association between vitamin D and autoimmunity comes from research on systemic lupus erythematosus (SLE). Vitamin D deficiency was more common in SLE patients than in healthy controls, as documented in multiple studies [10-16]. In the Middle East, a report on Saudi patients showed an unusually highly prevalent D insufficiency of 98.8% and deficiency of 89.7% respectively [17]. The contributory factors for the D inadequacy included, avoiding sun exposure due to photosensitivity, chronic renal disease, corticosteroids and hydroxychloroquine therapy, and the presence of vitamin D antibodies particularly in anti-phospholipid syndrome (APLs) [1,2,18,19]. Hypovitaminosis D was also noticed to be associated with higher disease activity [20-23]. However, in other studies such association was not observed [24,25].

The association between hypovitaminosis D and RA is not yet clearly established. *Several reports including meta-analysis on a large number of patients indicated that RA patients had lower vitamin D values than the healthy controls and there was a negative association between the serum vitamin D and RA disease activity [26-29]. Other workers nonetheless, found no correlation between vitamin D deficiency and the risk of developing RA or disease activity.* Grazio, et al. *have found no difference in 25(OH) D levels between RA patients and controls, but an increased incidence of deficiency in undifferentiated arthritis was noted [30]. Rai, et al. evaluated the status of vitamin D in RA patients and proved that neither the serum vitamin D levels nor vitamin D deficiency in RA patients were significantly different from controls probably because the vitamin D levels were significantly low among the general Indian population [31].In an earlier study from Saudi Arabia, the vitamin D levels in RA patients were similar to the healthy control group. Significantly lower 25(OH)D values, however, were found in patients who were poorly responding to treatment [32].*

In the latest study on two cohorts of patients without a history of Vitamin D supplementation((61 patients with 11 different autoimmune diseases (AIDs) and 77 without)), the mean of 25 (OH) D in patients with AIDs was surprisingly, significantly higher (24.5 ± 7.89 ng/ml) than that of the other group (19.3 ± 7.29 ng/ml), p = 0.0001 .Hypovitaminosis D of (25 (OH) D < 30 ng/ml) was present in both groups (83% and 92% respectively,) p = 0.21 .Moreover, the mean of hypovitaminosis D was also higher in the AIDs patients (21.8+/- 5.2 *vs.* 18. ± 5.7), p = 0.0002. Secondary hyperparathyroidism (SHPTH) was also commoner in the patients without AIDs but with borderline significance, p = 0.053 [33].

Although the current study provides a new insight into this issue as it provides a comparison between two major AIDs yet emphasizes some of the conclusions extracted in the previous study [33]. It became evidently clear that hypovitaminosis D, mainly insufficiency though appeared common among the patients with RA & SLE patients yet was significantly more common in the control group and in that been quoted earlier in healthy individuals [6].

The levels of 25 (OH) D were noted to be significantly higher in the patients with AIDs (RA & SLE) than in the control group. Data relevant to SHPTH failed to determine differences between the groups. Of interest though the new finding that patients with RA and SLE have exhibited comparable vitamin D

Table 1: The comparable data of hypovitaminosis D in the 3 groups.

	RA (35)	SLE (26)	P
Hypovitaminosis D (< 30 ng/ml)	26(74%) Def 1(3%)	19 (73%) Def 3 (11.5%)	1.000
Mean :	20.9 ± 4.76 ng/ml	21.3 ± 8.19	0.87
	RA (35)	**Control (77)**	**P**
Hypovitaminosis D (< 30 ng/ml)	26 (74%)	71 (92%)	0.0156
Mean :	20.9 ± 4.76 ng/ml	18.0 ± 5.77	0.021
	SLE (26)	**Control (77)**	**P**
Hypovitaminosis D (< 30 ng/ml)	19 (73%)	71 (92%) Def 5 (6.5%)	0.0179
Mean :	21.3 ± 8.19	18.0 ± 5.77	0.047

Deficiency of 25 (OH) D: < 10 ng/ml.(Ps = ND).

Table 2: The relevant data of the secondary hyperparathyroidism (SHPT) among those with hypovitaminosis D in the 3 groups.

	RA	SLE	P
PTH >65 pg/ml	8 /26 30.5%	3/18 (16.5%)	0.483
	RA	Control	P
PTH >65 pg/ml	8 /26 (30.5%)	29/71 (41%)	0.482
	SLE	Control	P
PTH >65 pg/ml	3/18 (16.5%)	29/71 (41%)	0.098

The mean of total serum calcium (t Ca) was similar in the groups (9.49 ± 0.42 , 9.42 ± 0.48 & 9.50 ± 0.40 mg/dl in the groups respectively, Ps = NS).

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records. Such comparison can be enlarged upon in studying a larger number of patients under the same condition of lacking vitamin D supplementation.

Conclusion

Patients with RA and others with SLE exhibited a lower prevalence of hypovitaminosis D along with higher levels of 25 (OH) D compared to the control group. However, these two conditions interestingly expressed comparable findings of (prevalence of hypovitaminosis D and level of 25 (OH) D). Therefore, these findings may cause some controversy or perhaps a challenge to the widespread understanding of the contrary as per previous international and regional studies. The findings here argue further the concept of a specific association between hypovitaminosis D and autoimmune disease and encourage wider estimation of 25 (OH) D among patients in general medical practice. Finally, the outcomes of this work deserve further study/ies in larger groups in the future.

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