ORIGINAL ARTICLE

Evaluation of serum level of 25-hydroxy vitamin D in vitiligo patients

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ABSTRACT

Introduction: Vitiligo is an acquired skin disease characterized by loss of functional melanocytes from the epidermis. Despite the several factors studied, the pathogenesis of vitiligo remains unclear. Vitiligo could be associated with low vitamin D levels.

Objective: The aim of this study was to evaluate serum 25(OH) D levels in vitiligo patients in comparison of normal controls.

Patients and Methods: After meeting inclusion and exclusion criteria, serum 25 hydroxy vitamin D levels were assayed in all subjects included in this case control study (40 patients and 40 age and sex matched healthy individuals). Vitiligo Area & Severity index (VASI), BSA, age of patients and duration of vitiligo were evaluated in relation to vitamin D level.

Results: A total of 80 participants were enrolled in our study, 40 patients with non-segmental vitiligo and 40 who served as controls. The mean serum level of vitamin D were significantly decreased in the patients group as compared with the control group (20.75 nmol/l ± 9.16 vs 39.90 nmol/l ±12.69, $P < 0.05$). There was non-significant correlation between vitamin D level, age, duration of vitiligo and body surface area ($P>0.05$). However there was a significant correlation between vitamin D level and Vitiligo Area & Severity Index (VASI) score.

Conclusion: In this study, we found a significant 25(OH) D deficiency in patients with non-segmental vitiligo, suggesting that vitamin D deficiency may play a role in the pathogenesis of vitiligo.

KEY WORDS: Vitamin D, 25(OH) D, vitiligo

INTRODUCTION

Vitiligo (leukoderma) is a pigmentary disorder in which melanocytes the cells that make pigment which gives color to the skin, are destroyed. This results in smooth, white patches in the midst of normally pigmented skin.[1] Vitiligo is a progressive depigmenting disorder characterized by loss of functional melanocytes from the epidermis.[2] Vitiligo is an acquired skin disease, worldwide prevalence was noted as 0.5% to 1% while there were also peaks up to 8%.[3] Despite the several factors studied, the pathogenesis of vitiligo remains unclear. Different hypotheses have been proposed to explain this disorder and the pathomechanisms might include biochemical, oxidant antioxidant, neural, viral and autoimmune processes.[4] There are also some evidences for cellular immune reactions against melanocytes.[5] Vitamin D is a steroid hormone, and besides its known metabolic function was shown to have non-calciotropic immunomodulatory role through its varied effects on T and B lymphocytes, macrophages, and dendritic cells, which express nuclear vitamin D receptors.[6] The aim of this study was to evaluate serum 25(OH) D

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levels in vitiligo patients with or without systemic autoimmune diseases in comparison of normal controls.

PATIENTS AND METHODS

This case control study in which 40 patients with non-segmental vitiligo were enrolled at outpatient clinics of the Al-Hussein University hospital, Faculty of Medicine, Al-Azhar University, Cairo, Egypt, after the approval of the Research ethical committee of Faculty of medicine, Al-Azhar University. This study included forty clinically diagnosed patients of non-segmental vitiligo (30 males and 10 females), their ages varied from 8 to 60 years old. The control group included 40 age and sex matched healthy individuals (age varied from 18 to 45 years: mean age was 32.9) who were enrolled randomly from our clinics from December 2014 to June 2016 after obtaining an informed consent. Patients suffering from any other skin or autoimmune disorders had been excluded in addition to patients with segmental vitiligo, patients who had previous treatment with PUVA and pregnant and lactating women.

All subjects underwent a complete medical examination and laboratory tests. Laboratory tests were performed within 30 days of enrollment in the study and included vitamin D levels. In all patients diagnosed with non-segmental vitiligo, serum 25 (OH) vitamin D levels were measured using a commercial enzyme immunoassay, DRG® 25-OH Vitamin D total ELISA Kit (DRG international, Inc., USA). The normal range of vitamin D levels was 30-50 ng/ ml. We then defined vitamin D insufficiency as vitamin D < 30 ng/ml and vitamin D deficiency as < 10 ng/ml.[7]

The degree of depigmentation was measured by VASI determined by the product of the area of vitiligo in hand units (set as 1% per unit) and the extent of depigmentation within each hand unit-measured patch.[8]

Data Management and Analysis

The collected data was revised, coded, tabulated and introduced to a PC using Statistical package for Social Science (SPSS 19 for windows; SPSS Inc, Chicago, IL). Continuous variables were expressed as the mean ± standard deviation. The chi-square test was used to test differences in categorical variables between the two groups. A multivariate analysis was performed to determine the association between the occurrence of AA and the variables. A P value < 0.05 was considered significant.

Ethics

All the participants including cases and controls gave their written informed consents after being informed about the aims and process of the study.

RESULTS

A total of 80 participants were enrolled in our study, 40 patients with non-segmental vitiligo and 40 who served as controls. The patients group comprised 30 males and 10 females with a mean age of 28.70 ± 13.44 years and mean duration of diagnosis 4.7±4.37 years. As regarding family history of vitiligo, 10 patients (25%) had a positive history of vitiligo and 30 patients (75%) had a negative history of vitiligo. Of the 40 patients in the control group, 25 were males and 15 were females with a mean age of 32.95 ± 9.24 years.

The mean serum level of vitamin D were significantly decreased in the patients group as compared with the control group (20.75 nmol/l ± 9.16 vs 39.90 nmol/l ±12.69, P < 0.05) (Table 1).

Table 1 Comparison of vitamin D level between patients and controls

	Group				P	Sig
	Patients		Control			
	Mean nmol/l	±SD	Mean nmol/l	±SD		
Vitamin D level	20.75	9.16	39.90	12.69	0.001‡	S

‡Student t test

Table 2 Comparison between patients and controls as regard vit D level

N		Patients		Control		P	Sig
		%	N	%			
Vitamin D level	Deficient (n %)	8	20.0%	0	0.0%	0.001**	S
	Insufficient (n %)	22	55.0%	4	10.0%		
	Sufficient (n %)	10	25.0%	36	90.0%		

**Fisher exact test

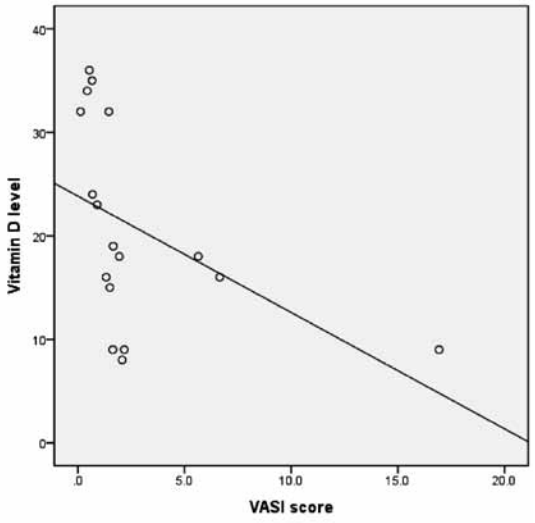

Fig. 1 Correlations between VASI score and vitamin D level among cases.

There was a significant difference between patients and controls regarding vitamin D levels, 8 patients (20%) had deficient level of 25(OH)D (<12nmol/l), 22 patients (55%) had insufficient level (>12and<30nmol/l) and 10 patient (25%) had sufficient level (<30nmol/l). All controls had a sufficient level (<30nmol/l) except 10 controls who had insufficient level of 25(OH)D.

There was non-significant correlation between vitamin D level, age, duration of vitiligo and body surface area (P>0.05: Non significant (NS). However there was a significant correlation between vitamin D level and Vitiligo Area & Severity Index (VASI) score (Fig. 1).

DISCUSSION

Vitiligo is an acquried disease with a variable course. It is characterized clinically by well-defined depigmented macules or patches thought to occur secondary to melanocyte dysfunction and loss. It is the most common depigmentation disorder, affecting approximately 0.5 to 2.0 percent of the population and has no predilection for gender or race.[9]

Pathogenic causes are likely multifactorial, including genetic influences, dysfunctional biochemical pathways, autoimmune processes, melanocyte adhesion deficits, and nervous system imbalances.[10]

The aim of this study was to evaluate serum 25(OH) D levels in vitiligo patients in comparison of normal controls. In the current prospective study, there were a significant difference of serum levels of 25(OH) D between patients and their age and gender matched healthy controls.

In agreement with our study, Beheshti et al.[11] in their study on the level of serum 1,25 (OH) D among vitiligo patients found that was less than 25nmol/L and the level between 25-47 was described respectively as a severe lack of vitamin D and insufficient level of vitamin D. Also, Saleh et al.[12] in their case-control study on 40 vitiligo patients (20 patients with systemic autoimmune diseases and 20 patients without autoimmune diseases) and 40 healthy, age, gender and skin phototype matched controls, found that 39 pa-

tients (97.5%) versus 5 controls (12.5%) have deficient 25(OH) D levels with significantly lower serum 25(OH) D levels in patients compared to controls.

In disagreement with our results, Xu et al.[13] in their case control study on Chinese patients with vitiligo, found that there was a non-significant difference between vitiligo patients and controls in serum 1,25(OH)D. They stated that Chinese population are mainly Fitzpatrick phototype III and IV with an increased risk of vitamin D insufficiency, therefore they do not support a role for vitamin D in vitiligo pathogenesis, so that more studies are needed to determine if ethnicity matters in the cases.

Our study showed there was no correlation between vitamin D level, age, duration of vitiligo and body surface area (P>0.05). However there was a correlation between vitamin D level and vitiligo area & severity index (VASI) score.

In agreement to our study, Saleh et al.[12] found no significant correlations existed between age of the patients, duration of vitiligo, family history and serum 1,25(OH)D levels of patients.

In agreement to our study, Ustun et al.,[14] showed no correlation between the vitamin D and the affected body surface area, age and duration of the vitiligo as a total of 25 patients and 41 controls were included in that study with the mean levels of vitamin D in the patient were 15.2 ± 5.2 ng/dL.

In disagreement to our study, Doss et al.[15] showed that the affected BSA was higher in patients with 25(OH) D level above 30 ng/ml compared to those with levels below 30 ng/ml, which means that the level of vitamin D could influence the extent of the disease.

CONCLUSION

In this study, we found a strong correlation between patients with vitiligo and 25(OH) D deficiency, suggesting that vitamin D deficiency may play a role in the pathogenesis of vitiligo. More studies with a large number of patients are needed to confirm this hypothesis.

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