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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. Despitethe several factors studied, the pathogenesis of vitiligo remains unclear. Vitiligo could be associated with low vitamin D levels. The aim of this study was to evaluate serum 25(OH) D levels in vitiligo patients in comparison of normal controls. **Methods:** After meeting inclusion and exclusion criteria, serum 25 hydroxy vitamin D levels were assayed, in all subjects included in this case control study (21 patients and 21 age and sex matched healthy individuals). Vitiligo disease activity index (VIDA), affected body surface area (BSA),site of lesion, age of patients and duration of vitiligo were evaluated in relation to vitamin D level. **Results:** A total of 42 participants were enrolled in our study, 21 patients with vitiligo and 21 who served as controls. The mean serum level of vitamin D were significantly decreased in the patients group as compared with the control group (17.3ng/ml ± 5.3 vs 25.8 ng/ml ±7.9, P = 0.006). There was non-significant correlation between vitamin D level with age, duration of vitiligo, and affected body surface area (P>0.05), but there was significant difference in 25(OH)D levels between different grades of VIDA. **Conclusion:** In this study, we found a significant 25(OH) D deficiency in patients with vitiligo, suggesting that vitamin D deficiency may plays a role in the pathogenesis of vitiligo.

Keywords: Vitamin D, 25(OH) D, vitiligo

INTRODUCTION

Vitiligo is a common autoimmune disease that progressively destroys melanocytes in the skin, resulting in the appearance of patchy depigmentation. This disfiguring condition frequently affects the face and other visible areas of the body, which can be psychologically devastating[1].

Vitiligo affects approximately 1% of the world's population . both adults and children are affected with no predilection for sex or ethnicity. The average age at onset lies around the second to the third decade of life[2].

In recent years, vitamin D deficiency as a result of lifestyles with inadequate sun exposure, has received increased attention due to its association with the risk of serious chronic diseases. Since prolonged exposure to sunlight has been associated with risk for skin cancer, food fortification arises as an important option in obtaining vitamin D sufficiency[3].

AIM OF THE WORK

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

METHODS

This case control study in which 42 person were enrolled at Dermatology Outpatient Clinics of Zagazig University Hospital during the period from March 2018 till October 2018, after the approval of the Research ethical committee of Faculty of medicine, Zagazig University and obtaining an informed consent. This study included 21 clinically diagnosed patients of vitiligo (10 males and 11 females), their ages varied from

11 to 68 years. The control group included 21 age and sex matched healthy individuals, their ages varied from 4 to 54 years. The work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans.the study was approved by the research ethical committee of Faculty of Medicine, Zagazig University

Patients suffering from any other skin or autoimmune disorders, patients who had taken treatment for vitiligo in the last three months, pregnant and lactating women had been excluded.

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 and interleukin-21 levels. In all case and control groups, serum level of 25(HO) D was measured by MINI VIDAS machine which is a compact automated immunoassay system based on the Enzyme Linked Fluorescent Assay (ELFA) principles. Made in France. The normal range of vitamin D levels was 30-100 ng/ ml. We then defined vitamin D insufficiency as vitamin D < 30 ng/ml and vitamin D deficiency as < 10 ng/ml.

The degree of depigmentation was measured by Wallace role of nines. While the vitiligo activity measured by vitiligo disease activity score VIDA.

RESULTS

A total of 42 participants were enrolled in our study, 21 patients with vitiligo and 21 who served as controls. The patients group comprised 10 males and 11 females with a mean age of 30.8 ± 19.1 years and mean duration of diagnosis 9.3±6.9 years. Of the 21 participants in the control group, 10 were males and 11were females with a mean age of 30.6 ±13.2 years.

Table (1), showed that there was no statistically significance difference between the case and control groups in age, sex, smoking, diabetes mellitus and hypertension. **Table (2),** showed that there was statistically significant difference in serum 25(OH) D ,between the case and control groups. **Table (3),** showed that (33.3%) of the case group had 25(OH) D Deficient <10ng/ml while it was (9.5%) for control group. And (61.9%) of the case group and control group had 25(OH) D Insufficient 10-30 ng/ml. while (4.8%) had Sufficient >30 ng/ml in case group and (28.6%) for control group. With a statically significance difference. **Table (4),** showed the site of lesions, vitiligo disease activity index and affected body surface area of vitiligo in the case group. **Table (5),** showed that there was a statistically significance difference between the case and control groups comparing 25 hydroxy vitamin D according to vitiligo disease activity (VIDA) index, in the case group. **Table (6),** showed that there was no statistically significance difference between the case and control groups comparing 25 hydroxy vitamin D according to affected body surface area of vitiligo in the case group

Table 1. Comparing socio-demographic characteristics and chronic diseases between case and control groups.

Variable	Cases mean ± SD (Range)		Controls mean ± SD (Range)		Test	p-value
Age (years)	30.8±19.1 (11-68)		30.6±13.2 (4-54)		**M.W** 0.03	0.9
Variable	**Cases**		**Controls**		**χ^2**	**p-value**
	Numberof cases (21)	**%**	**Number of controls (21)**	**%**		
Gender					0	
Male	10	47.6%	10	47.6%		1
Female	11	52.4%	11	52.4%		
Smoking					**FET**	
No	18	85.7%	16	76.2%		0.3

Yes	3	14.3%	5	23.8%		
Diabetes mellitus					**FET**	
No	21	100.0%	20	95.2%		1
Yes	00	0.00%	1	4.8%		
Hypertension					**FET**	
No	21	100.0%	18	85.7%		0.2
Yes	00	0.00%	3	14.3%		

M.W= Mann-Witenney U test.
FET= Fischer Exact test.
χ^2 = chi square test.

Table 2. Comparing serum 25 hydroxy vitamin D level between case and control groups.

Variable	Cases mean ± SD (Range)	Controls mean ± SD (Range)	Test	p-value
25(OH) D	17.3±5.3 (8.1-33.4)	25.8±7.9 (10.4-56.8)	t-test 2.8	**0.006***

* Statistically significant difference (P ≤ 0.05)

Table 3. Comparing 25-hydroxy vitamin D sufficiency between case and control groups.

25(OH) D	Case (21)		Control (21)		χ^2	p-value
	No.	**%**	**No.**	**%**		
Deficient <10ng/ml	7	33.3%	2	9.5%	6.3	0.02*
Insufficient 10-30 ng/ml	13	61.9%	13	61.9%		
Sufficient >30 ng/ml	1	4.8%	6	28.6%		

Table 4. Site of lesions, vitiligo disease activity index and affected body surface area of vitiligo in the case gro.

Variable	Number of patients (21)	%
Site of lesions		
Focal	2	9.5%
Segmental	2	9.5%
Acro-facial	6	28.5%
Generalized	11	52.4%
VIDA		
0	3	14.3%
1	2	9.5%
2	2	9.5%
3	6	28.6%
4	8	38.1%

Affected (BSA)of vitiligo		
3-15%	3	14.2%
15-28%	7	33.3%
28-40%	11	52.4%

Table 5. Comparing 25 hydroxy vitamin D according to vitiligo disease activity (VIDA) index, in the case group.

VIDA score	Number of patients (21)	25(HO)D mean ± SD (Range)	Kruskal Wallis Test	p-value
0	3	29.6±3.5 (26.3-33.4)	9.5	0.02*
+1	2	19.1±5.4 (15.2-22.9)		
+2	2	17.4±8.3 (11.5-23.3)		
+3	6	15.5±7.1 (8.3-25.5)		
+4	8	14.2±7.4 (8.1-33.4)		

Table (6): Comparing 25 hydroxy vitamin D according to affected body surface area of vitiligo in the case group.

BSA	Number of patients (21)	25(OH) D mean ± SD (Range)	Kruskal Wallis Test	p-value
3-15%	3	28.9±3.7 (26.3-32.4)	4.5	0.6
15-28%	7	18.3±7.3 (11.5-25.3)		
28-40%	11	14.6±6.4 (8.1-34.3)		

DISCUSSION

In the current case control study, the mean age of the case group was 30.8 ±19.1 ranged from (11-68) years, 52.4 % of them female, while the mean age of the control

group was 30.6±13.2 ranged from(4-54) years, 52.4 % of them female.

Different mean of ages were found in another studies; 31.3 years and 28.11 years respectively Nunes and Esser[4] and Nejad et al. [5]**.** However in Bouayad et al. [6]**.** studied group average age 36.7 years. These data reinforced that vitiligo is a disease that occurs at any age.

Our study showed there was a significant difference of mean serum levels of 25-(OH) D between patients (17.3 ng/ ml) and their age and gender matched healthy controls (25.8 ng/ ml.) , (P = 0.006). In agreement with our study, Beheshti et al. [7]**.** in their cross-sectional study included 100 patients with Vitiligo found that the mean level of serum 25(OH) D was 42 nmol/L which had a significance difference with a normal level; (P = 0.042).

Also, Saleh et al. [8]**.** in their case-control study on 40 vitiligo patients and 40 healthy, age, gender matched controls, found that 39 patients (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. statistically highly significant lower serum 25(OH)D levels existed in patients compared to controls (P = 0.0001).

Parallel to this Shalaby and Ibrahim[9]**.** in their case control study included 40 vitiligo patients and 40 age and sex matched healthy individuals, reported that, there was a strong correlation between patients with vitiligo and 25(OH) D deficiency.

While, Xu et al. [10]**.** in their case control study on 280 chines patients with vitiligo, found non-significant difference between vitiligo patients and controls in serum 25(OH) D, therefore they do not support a role for vitamin D in vitiligo pathogenesis.

On the other hand, our study demonstrated that was statistically significant negative correlation between patients serum level of 25 (OH) D and disease activity assessed by VIDA index, (p value = 0.003). While in a cross sectional study conducted by singla et al. [11]**.** on 75 patients with vitiligo and 75 control, showed no significant correlation between serum 25(HO)D with VIDA index, (P value = 0.518).

On the contrary, Doss et al., [12] in their case control study included 30 vitiligo patients and 30 age, gender matched healthy control, find no relation between the level of 25(HO)D and the disease activity assessed by VIDA score.

In current study there was non-significant correlation existed between age, sex, affected body surface area, duration and family history of vitiligo with 25 (HO)D level in case group.

Parallel to this, Saleh et al., [8]found no significant correlations existed between serum 25(OH)D with age, duration of vitiligo, family history of vitiligo and affected body surface area of the case group.

Consistent with our results, Ustun et al., [13] a total of 25patients and 41 controls were included in the cross sectional study, showed no correlation between 25 (HO)D with age ,affected body surface area and duration of the disease in the patients with vitiligo.

Also singla et al. [11]**.** in their cross sectional study showed no significant correlation between serum 25 (HO)D with age, sex, affected body surface area and duration of disease in patients.

Inconsistent with our results, Doss et al., [12]showed that the affected body surface area 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

Based on the results obtained in the present study, we can conclude that vitamin D deficiency is present in vitiligo patients, 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.

Accordingly, screening for vitamin D deficiency seems of value in vitiligo patients. Moreover, the growing enthusiasm for vitamin D supplementation in autoimmune

diseases emphasizes the need for timely and thorough testing of this hypothesis on a large sample size of vitiligo patients to assess the efficacy of oral vitamin D supplementation on controlling long-term disease activity and the possibility of prevention of disease onset in susceptible family members of vitiligo patients.

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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