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Evaluation of serum vitamin D levels in vitiligo patients

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***Abstract*---**Background: Recent studies have shown that vitamin D has an immune-protective effect. The role of vitamin D deficiency and VDR gene polymorphisms has been established in many autoimmune diseases, including vitiligo, but the results are still controversial. Aim of the study: To evaluate serum vitamin D levels in vitiligo patients. Materials and methods: For the study, we selected 60 clinically diagnosed cases of dermatology vitiligo and 60 controls which consisted of healthy volunteers with matched age and sex. A comprehensive history was obtained from each participant and each case was studied and closely reviewed. Results: The number of males in cases was 34 and the number of females in cases was 26. The number of males in controls was 33 and number of females was 27. The mean age of cases was 34.69 years and mean age of controls was 37.39 years. It was observed that vitamin D deficiency was seen in 51.6% cases and severe vitamin D deficiency was seen in 25% cases. On the contrary, normal vitamin D levels were seen in 66.7 % of controls and deficiency was seen in 26.6% of controls. Conclusion: Within the limitations of the present study, it can be concluded that vitamin D deficiency and vitiligo has strong correlation. Thus, vitamin D supplementation in vitiligo treatment can be highly beneficial.

***Keywords*---**vitamin D, vitiligo, deficiency, serum.

Introduction

Vitiligo is an acquired and multifactorial pigmentation disorder with a complex pathogenesis that is not clearly elucidated. Various hypotheses have been proposed for the pathogenic mechanisms of vitiligo, but the most important hypothesis is thought to be the autoimmune mechanism.[1] Globally, the

prevalence of vitiligo was estimated to be ranging from a low of 0.5% to a high of 2.0% in adults, and the peak onset period is between 10 and 30 years of age.[2] Although vitiligo does not bring fatal risk, it is often accompanied by a variety of autoimmune system-related diseases, such as Hashimoto's thyroiditis, diabetes, Addison's disease and so on. [3,4] Recent studies have shown that vitamin D has an immune-protective effect. The role of vitamin D deficiency and VDR gene polymorphisms has been established in many autoimmune diseases, including vitiligo, but the results are still controversial. [5] Hence, the present study was conducted to evaluate serum vitamin D levels in vitiligo patients.

Materials and Methods

The present study was conducted from April 2020 to March 2021 in the Department of Dermatology, Bhima Bhoi Medical College Balangir. The ethical clearance for the study was approved from the ethical committee of the hospital. For the study, we selected 60 clinically diagnosed cases of dermatology vitiligo and 60 controls which consisted of healthy volunteers with matched age and sex. A written informed consent was obtained from the participants. A comprehensive history was obtained from each participant and each case was studied and closely reviewed. A thorough general physical exam was done for each participant and comprehensive systematic analysis for related diseases were also performed and the outcomes were noted. In order to identify the condition and to know the nature of the vitiligo and to examine particular characteristics, such as trichrome, quadrichrome and leukotrichia, a thorough dermal analysis including mucosa was conducted.

The statistical analysis of the data was done using SPSS version 11.0 for windows. Chi-square and Student's t-test were used for checking the significance of the data. A p-value of 0.05 and lesser was defined to be statistically significant.

Results

Table 1 shows the demographic data of the participants. The total number of participants in the study was 120. 60 participants were cases of dermatology vitiligo and 60 were controls. The number of males in cases was 34 and the number of females in cases was 26. The number of males in controls was 33 and number of females was 27. The mean age of cases was 34.69 years and mean age of controls was 37.39 years.

Table 2 shows the serum vitamin D3 levels in cases and controls. It was observed that vitamin D deficiency was seen in 51.6% cases and severe vitamin D deficiency was seen in 25% cases. On the contrary, normal vitamin D levels were seen in 66.7 % of controls and deficiency was seen in 26.6% of controls. The results on comparison were found to be statistically significant ($p<0.05$).

Table 1
Demographic data of the participants

Demographic variables	Group	
	Cases, n (%)	Controls, n (%)
Number of males	34	33
Number of females	26	27
Mean age (years)	34.69	37.39

Table 2
Serum vitamin D3 levels in cases and controls

Serum Vitamin D3 (ng/ml)	Group	
	Cases, n (%)	Controls, n (%)
Severe deficiency (<10)	15 (25)	4 (6.7)
Deficiency (10-30)	31 (51.6)	16 (26.6)
Normal (>30)	14 (23.4)	40 (66.7)
Total	60	60
p-value	0.002	

Discussion

In the present study, we observed statistically significant correlation between vitiligo and vitamin D deficiency. Out of total 60 cases, normal vitamin D level was seen in 23.4 % cases only, whereas, 66.7 % controls had normal vitamin D levels. These results support strong correlation between vitamin D deficiency and vitiligo. The results were compared with previous studies from the literature and results were found to be consistent. Varikasuvu SR et al[6] evaluated the association between Vitamin D and vitiligo. Compared with controls, vitiligo patients showed significantly decreased serum Vitamin D levels. The sub-group analysis showed that vitiligo patients with indoor/urban work had a significantly lower Vitamin D level when compared to their outdoor/rural counterparts. The sensitivity analysis indicated that no single study had a significant influence on the overall outcome, suggesting the robustness of this meta-analysis. Mahmmod Z et al[7] analyzed the incidence of vitamin D deficiency in patients with vitiligo and explored the effect of this deficiency on disease extension and severity. This was a cross-sectional study involving 46 patients with vitiligo. The affected body surface area of the patients was assessed using the Vitiligo Extent Tensity Index (VETI) score. Most of the vitiligo patients had very low levels of vitamin D, and a majority of the vitiligo patients with low vitamin D levels were females; however, this difference between females and males was not statistically significant. There was no significant effect of vitamin D levels on VETI scores. They concluded that patients with vitiligo have a high incidence of vitamin D deficiency, and this deficiency is more common among females than males.

Karagün E et al[8] evaluated serum vitamin D levels of vitiligo patients and compared the results with controls. In total, 50 vitiligo patients and 47 controls were enrolled in the study. Vitamin D levels were measured from blood samples. Group comparisons were performed using appropriate statistical methods. The

patients had lower serum vitamin D levels than the controls, but this difference was not significant. They concluded that it remains unknown whether vitamin D deficiency causes vitiligo. Saleh HM et al [9] evaluated serum 25(OH)D levels in vitiligo patients with and without systemic autoimmune diseases. A case-control study was conducted on 40 vitiligo patients (20 patients with systemic autoimmune diseases and 20 patients without autoimmune diseases) and 40 age, gender- and skin phototype-matched healthy controls. Serum 25(OH)D was measured in all subjects, divided into: normal or sufficient (≥ 30 ng/ml), insufficient (< 30-> 20 ng/ml) and deficient (≤ 20 ng/ml) levels. One patient with vitiligo (2.5%) versus 33 healthy controls (82.5%) have sufficient serum 25(OH)D levels while 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 (P-value < 0.001). The other 2 healthy controls have insufficient 25(OH)D levels. Patients with vitiligo and autoimmune diseases have lower serum 25(OH)D levels than vitiligo patients without autoimmune diseases but with no significant difference. No significant correlations existed between age of the patients, duration of vitiligo, duration of associated autoimmune diseases, affected body surface area and serum 25(OH)D levels of patients. They concluded that deficient serum 25(OH)D levels are present in vitiligo patients with and without systemic autoimmune diseases.

Conclusion

Within the limitations of the present study, it can be concluded that vitamin D deficiency and vitiligo has strong correlation. Thus, vitamin D supplementation in vitiligo treatment can be highly beneficial.

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