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Assessment of serum vitamin D levels in patients with vitiligo

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Abstract
Background: Vitiligo is an autoimmune pigment disease, and is marked by well-defined depigmented patches or macules attributable to the loss of functioning melanocytes in the epidermis and hair infundibulum.
Objective: To test serum levels of Vitamin D and contrast effects and controls in vitligo patients.
Methods: It is a case-control study conducted in a hospital setting that involves 100 patients out of which 50 cases and 50 controls. All of those participating in the study underwent a thorough general physical examination. A comprehensive systematic analysis for related diseases has also been carried out and the outcomes have been 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 has been conducted.
Results: The majority of the patients belonged to the age group of 21 to 40 years around 37%. The majority of our study subjects were male constituting 53% and females were 47%. The most prominent vitiligo seen was Vulgaris in 48%. In 72% of the cases, the duration of Vitiligo was < 5 yrs. 54% of the patients in the Case group and 52% of the patients in the control group had Serum Vitamin D deficiency. In 26% of the patients in the Case group and 8% in the control group had severe Vitamin D deficiency.
Conclusion: The serum cholecalciferol and vitiligo are strongly associated with this analysis. The clinical type, duration, and severity of vitiligo are also greatly associated with cholecalciferol.

Keywords: qudrichrome, vitiligo, leukotrichia, vulgaris, vitamin D, cholecalciferol

Introduction
Vitiligo is an autoimmune pigment disease and is marked by well-defined depigmented patches or macules attributable to the loss of functioning melanocytes in the epidermis and hair infundibulum. It has an equal effect on all genders and races. Inheritance with variable penetration is polygenic or autosomal. Vitiligo is a primary, typically progressive, unexplained aetiology, Melan cytopenia characterized by well-restrained pigment macules of varying shapes and sizes.
Vitamin D is an important hormone that is synthesized in the skin, and it functions in different mechanisms to protect the epidermal melanin unit. It has been found that in patients with vitiligo and other autoimmune disorders, Vitamin D levels are poor. The association between vitamin D and vitiligo has been studied only for certain times around the globe and even less for India as a whole not to mention India [1].
Vitiligo has an important psychological and social impact on people particularly affected in women or in exposed places.
Autoimmune is the most common cause. The nature of generalized vitiligo families with the other autoimmune disorders suggests an autoimmune trend and poses concerns regarding a hereditary autoimmune disorder. While certain individuals have anti-melanocyte or melanocyte protein antibodies, it is not evident if they are the origin of the melanocyte or the product of the antibodies [2].
Since the most common aetiology of vitiligo is autoimmune and instead, vitamin D was recognized as an essential factor in the body's natural and acquired immune system and also because of the topical efficacy of vitamin D in vitiligo losing pigmentation.

Materials and Methods

It is a case Control study conducted in a hospital setting that involves 100 patients out of which 50 cases and 50 controls. The cases of dermatology vitiligo that are clinically diagnosed are the cases.

The control group consisted of age matched and sex matched healthy volunteers. Both those involved in this analysis received informed consent. Each case was studied and closely reviewed with a comprehensive history and separately recorded in a special proforma for cases and controls.

Precipitation factors such as trauma, additives, stress, correlations have been specifically asked for and noted. Suggested history of thyroid dysfunction, atopy, diabetes was also recorded.

All of those participating in the study underwent a thorough general physical examination. A comprehensive systematic analysis for related diseases has also been carried out and the outcomes have been 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 has been conducted.

Inclusion Criteria

- >18 years of age with vitiligo.

Exclusion Criteria

- Other conditions with depigmentation such as chemical leukoderma, albinism, achromic naevus.

Statistical Analysis:

SPSS software version 22 has been used for statistical analysis. Data were presented as statistical tables and charts.

Ethical Clearance: Ethical clearance was obtained from College institutional ethics committee prior to the commencement of the study.

Observation and Results

A total of 100 patients who met the inclusion criteria were included in our study, out of which 50 were cases and 50 were controls.

Table 1: Distribution based on age group and Gender

Age (in years)	Group	
	Case n (%)	Control n (%)
≤ 20	11 (22%)	11 (22%)
21 - 40	18 (36%)	19 (38%)
41 - 60	18 (36%)	17 (34%)
>61	3(6%)	3(6%)
Total	50 (100%)	50 (100%)
Gender	**Group**	
Male	23 (46%)	24 (48%)
Female	27 (54%)	26 (52%)

Majority of the patients belonged to the age group of 21 to 40 years around 37%, followed by 35% in the age group of 41 to 60 yrs. 22% of the patients were ≤20 yrs.

Least around 6% were >61 yrs age group. Majority of our study subjects were male constituting 53% and females were 47%.

Table 2: Type of Vitiligo

Type of Vitiligo	Sex	
	Male n (%)	Female n (%)
Focal	2 (8.7%)	4 (14.8%)
Mucosal	3 (13%)	4 (14.8%)
Segmental	4 (17%)	2 (7.4%)
Acrofacial	3 (13%)	2 (7.4%)
Vulgaris	10 (43.4%)	14 (51.9%)
Universalis	1 (4.3%)	1 (3.7%)
Total	23 (100.0)	27 (100.0)

In the cases Vitiligo was more prominent in the females, 54% compared to males with 46% The most prominent vitiligo seen was Vulgaris in 48% of the cases combined. Mucosal Vitiligo was seen in 14% of the cases.

Segmental and Focal Vitiligo were seen in 12% of the cases each. Acrofacial Vitiligo was seen in 10% of the cases and the least was Universalis seen in 4% of the cases.

Table 3: Duration of Vitiligo

Duration (in years)	Sex	
	Male n (%)	Female n (%)
≤ 5	16 (69.5%)	20 (74%)
6 – 10	3 (13%)	3 (11.1%)
11 – 15	1 (4.3%)	2 (7.4%)
16 – 20	2 (8.7%)	1 (3.7%)
≥ 21	1 (4.3%)	1 (3.7%)
Total	23 (100.0)	27 (100.0)

In 72% of the cases the duration of Vitiligo was ≤ 5 yrs. In 20% of the cases duration of vitiligo was in between 6 to 10 yrs. In 6% of the cases each duration of vitiligo was between 11 to 15 yrs and 16 to 20 yrs. In 4% of the cases duration of vitiligo was ≥ 21 yrs.

Table 4: Correlation between Vitamin D and Vitiligo

Serum VIT D3(ng/ml)	Group	
	Case n (%)	Control n (%)
Severe Deficiency (<10)	13 (26%)	4 (8%)
Deficiency (10-30)	27 (54%)	26 (52%)
Normal (>30)	10 (20%)	20 (40%)
Total	50 (100.0)	50 (100.0)
p value	<0.001 - Significant	

In 54% of the patients in the Case group and 52% of the patients in the control group had Serum Vitamin D deficiency. In 26% of the patients of Case group and 8% in the control group had Severe Vitamin D deficiency.

Discussion

Vitamin D is a synthesized essential hormone in the skin, with deficiency linked to many immune, metabolic, and pigment disorders. Vitamin D has been shown to improve melanogenesis and tyrosinase in culturally developed melanocytes.

Indian case-control study performed by Prakash D *et al*, [2] 45 cases and 45 age and gender-matched controls were compared. In another Iranian study, 30 cases were compared with 30 years of age and gender-matched controls [4]. In a Turkish study conducted by Karagun *et al*, [5] 50 patients with vitiligo and 47 controls were compared.

In another Turkish study performed by Takci Z., [6]. 44 Vitiligo Vulgaris patients were compared with 43 controls. As a result, this study contained more cases and controls compared to other research.

No significant correlation existed between vitiligo type and vitamin D serum. It has been the case in all prior studies, which have shown that vitamin D does not play a role in deciding the clinical form of vitiligo that the patient develops. In patients with autoimmune comorbidity in our sample, vitamin D levels have not decreased dramatically. Khurrum *et al*. [7] Saleh et al [8] and Beheshti *et al*. [9] found similar findings. All other studies have shown that vitamin D levels have decreased significantly in patients with autoimmune comorbidity [10]. Need to find a correlation in the Indian background in additional experiments of a greater sample size.

In an endemic nation like India with a prevalence of 70-100%, the exact role of vitamin D in Vitiligo is difficult to ascertain.

The drawbacks of the sample include a smaller study population and lack of representation of different social classes. The composition of the wider sample group from different strata of the population may have addressed this.

Conclusion

The serum cholecalciferol and vitiligo are strongly associated with this analysis. The clinical type, duration, and severity of vitiligo are also greatly associated with cholecalciferol. Our research promotes the role of low vitamin D in vitiligo pathogenesis and the role of vitamin D supplementations in vitiligo treatment. However, more research requiring greater samples are important because of our country's widespread vitamin D deficiency.

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