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Original Research Paper

Dermatology

LEVELS OF 25-HYDROXYVITAMIN D IN PATIENTS WITH PSORIASIS- A CROSS SECTIONAL OBSERVATIONAL CASE- CONTROL STUDY

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ABSTRACT

Background: Psoriasis is a common, immunologically mediated, inflammatory disease characterized by skin inflammation, epidermal hyperplasia, and increased risk of painful and destructive arthritis and cardiovascular morbidity and psychosocial challenges. Recent studies have shown higher prevalence of vitamin D deficiency in patients with psoriasis than in control groups. It has been recently discovered that, vitamin D has role in modulation of Type 1 helper T cell (Th1) pathway. Thus low levels of vitamin D is believed to have an important implication in pathogenesis of psoriasis. **Aims and objectives:** To determine the 25-hydroxyvitamin D status of patients with chronic plaque psoriasis in comparison with age and sex matched controls. **Materials and Methods:** Thirty consecutive consenting patients with chronic plaque psoriasis and 30 age and sex matched controls with minor dermatological diseases were recruited in this study. **Results:** The age of the subjects ranged from 18yrs to 62yrs. The number of males was more than females. The overall prevalence of vitamin D in the study sample was 75%. Eighty percent cases and 70% controls had deficiency of vitamin D. This study reveals that, the mean vitamin D was 16.23ng/do in case group and 19.29ng/dl in control group. The mean vitamin D was less in the cases as compare to controls, but it was not statistical significant. **Conclusion:** Due to high overall prevalence of vitamin D deficiency in India, many of the cases and controls had shown deficiency. Not statistically significant difference could be established between cases and controls with respect to serum vitamin D levels.

KEYWORDS : vitamin D, psoriasis, cases, controls

INTRODUCTION

Psoriasis is a chronic inflammatory skin disease that affects millions of people worldwide.(1) It is characterised by epidermal hyperproliferation and disordered maturation. It was previously thought to be a disorder of the keratinocyte.(2) But it is now well established that it is a disorder involving the innate immunity, acquired immunity and dendritic cells.(3) It is recognised as a T cell mediated inflammatory disorder with hyperpr oliferation of epidermal keratinocytes in genetically predisposed individuals.(4)

Recently many studies have demonstrated the varied functions of vitamin D in the body other than its role in bone and mineral metabolism. In psoriasis, it has been used as topical formulations (calcipotriol, calcitriol and tacalcitol) for the treatment either as monotherapy or in combination with topical steroids.(5) Vitamin D influences the immunological function of dendritic cells and T cells, which are the key players in the pathogenesis of psoriasis.(6,7) It inhibits the proliferation of keratinocytes and induces it's terminal differentiation.(8) There are recent studies showing increased prevalence of vitamin D deficiency in patients with psoriasis when compared to control groups.(9–12) Table 1 shows 25-hydroxyvitamin D guidelines from endocrine society

Table – 1 25 -hydroxyvitamin D Guidelines From Endocrine Society.

	Vit d levels
Deficient	0-20 ng/ml
Insufficient	21-29 ng/ml
Sufficient	30-100 ng/ml

Materials And Methods

Study design

This is a hospital based, cross-sectional observational case-control study. The study was done in the Dermatology, Venereology and Leprosy outpatient department of our tertiary care hospital from October 2019 to March 2021.

Inclusion criteria for cases:

- Age ≥ 18 years and ≤ 65 years.
- Chronic plaque psoriasis patients with or without arthritis attending dermatology outpatient department.

Exclusion Criteria for cases:

- Psoriasis patients in remission
- Oral vitamin D therapy (past or present), topical vitamin D or phototherapy in the last 3 months
- Patients with erythrodermic psoriasis, pustular psoriasis.
- Patients not willing to participate in the study
- Pregnancy and lactation

Inclusion criteria for controls:

- Age ≥ 18 years and ≤ 65 years
- Patients with non-psoriatic, non-photosensitive minor skin disorders attending dermatology outpatient department

Exclusion criteria for controls:

- Vitamin D therapy in the past or present
- Patients not willing to participate in the study
- Pregnancy and lactation

Methodology:

Psoriasis was diagnosed clinically. All the patients, with psoriasis and controls , who fulfilled the inclusion criteria, were enrolled into the study after obtaining informed consent. Age and sex matching was done between the subjects in patient and control group. The details pertaining to the study collected from the psoriasis patient group and from the control group was documented in separate clinical research proforma.

Statistical methods

Statistical data was analyzed by IBM SPSS 20.0 version software. Collected data were spread on excel sheet and prepared master chart. Through the master chart tables and graphs were constructed. For quantitative data analysis t-test was applied. For qualitative data analysis chi-square test and chi-square with Yates correction tests were applied for statistical significance. If P-value was less than 0.05 considered as significant

RESULTS

During the study period, 30 cases of chronic plaque psoriasis and 30 age and sex matched controls were examined for vitamin D deficiency. The age of the patients ranged between 18-62years, with most patients belonging to age group 20-40years. In our study 63.3% cases were males and 36.7% were females. Majority of study subjects (58.3%) were from semi-urban areas. In this study, 66.7% cases worked indoor and 33.3% worked outdoors. While in control group, 56.7% worked indoors and 43.3% worked outdoors. None of the study subjects used sunscreen. None of the patients with psoriasis had any family history. The overall prevalence of vitamin D in the study sample was 75%.(table 2)

Table No.2: Comparison of Vitamin D among Study and Control Groups

Vitamin D ng/ml	Study Group		Control Group		Total	
	No.	%	No.	%	No.	%
≤ 10	3	10.0	4	13.3	7	11.7
10.1-20.0	21	70.0	17	56.7	38	63.3
20.1-30.0	6	20.0	4	13.3	10	16.7
>30	0	0.0	5	16.7	5	8.3
Total	30	100.0	30	100.0	60	100.0
Mean ± SD	16.23 ± 5.18		19.29 ± 11.6		17.76 ± 8.21	
t-test value and P-value	t = 1.658 P = 0.103 NS					

NS= not significant

Eighty percent cases and 70 % controls had vitamin D deficiency. The mean vitamin D in cases was 16.23ng/dl and 19.29ng/dl in controls. The mean vitamin D was less among cases than in controls. However the difference was not statistically significant. There was no statistical difference between the case and controls, in relation to the locality, clothing style, skin type, dietary habits and sunscreen usage.

DISCUSSION

Our study showed overall prevalence of vitamin D deficiency of 75%. Gutte et al, from India reported a prevalence of 80% in their study.(13). In the studies by Gutte et al., Orgaz – Molina et al., Gisondi et al and Hesham Abd ElMoaty Zaher et al., there was statistically significant difference in the prevalence of vitamin D deficiency between the cases and controls, (9–16) while in our study, the difference was not statistically significant. In their study, only 30% of their controls had vitamin D deficiency whereas in our study, 70% of controls had vitamin D deficiency. This is probably a reflection of the overall high prevalence of vitamin D deficiency in Indian set up. The mean serum vitamin D level (ng/ml) among our cases was 16.23ng/dl and that of our controls was 19.29ng/dl. The mean serum vitamin D level among our patients was similar to that observed in the studies by Gisondi et al.(12) and Hesham Abd El-Moaty Zaher et al.(14) Gutte et al. reported a mean serum level of 13.53 ±3.43 ng/ml among cases and 20.80 ± 14.37 ng/ml among the controls.(13) Zargar et al.(16), in a study on the vitamin D status of apparently healthy adults in Kashmir have noted that the surface area of skin exposed affects the vitamin D status similar to our study. In our study the vitamin D level of the patients did not show significant difference with regard to type 1 and type 2 psoriasis, similar findings to the other studies. In the context of psoriasis, this has important implications, as in our study we observed that the cases wore more photo-protected type of clothing to avoid social embarrassment. Not many studies have assessed the effects of clothing pattern on serum vitamin D level in psoriasis. Our sample size was small and hence we could not arrive at a definitive conclusion regarding the difference in prevalence of vitamin D deficiency between the cases and controls, given the high prevalence of vitamin D deficiency in India. As in other studies, our study showed a high prevalence of vitamin D deficiency among patients with psoriasis. However though most studies found the prevalence to be significantly higher in psoriasis patients than in controls, our study did not show a significant difference when compared with comparable controls. Further studies with larger sample size are needed to study the effect of vitamin D on the disease and whether psoriasis is an independent risk factor for vitamin D deficiency. In addition to studying the role of metabolic syndrome on the vitamin D status of patients with psoriasis, future studies could also include parameters such as social avoidance and the actual sun-exposure, due to clothing styles used by the patients with psoriasis.

Limitation

Our sample size was small and due to the high prevalence of vitamin D deficiency in India we could not establish a significant difference in the prevalence of vitamin D deficiency between the cases and controls.

CONCLUSIONS

Higher proportions of patients with psoriasis were found to have vitamin D deficiency as compared to the controls, but not reaching a level of statistical significance. Clothing pattern may have a role in the observed difference in vitamin D status. Further studies with larger sample size are needed to assess the association between vitamin D status and psoriasis.

DECLARATIONS

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