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A case-control study of 25-hydroxyvitamin D deficiency in psoriasis patients

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Abstract

Introduction: Reduced vitamin D levels are found in some autoimmune diseases like rheumatoid arthritis, multiple sclerosis and more recently psoriasis.

Objective: This study was conducted to analyze vitamin D status of psoriasis patients in comparison to healthy controls.

Materials and Methods: This prospective case control study was conducted on 100 patients (50 with psoriasis and 50 age and sex matched controls) from the outpatient clinic of our dermatology department.

Results: Vitamin D levels were significantly lower in psoriasis patients compared with controls. Deficiency (<20 ng/mL) was seen in 96% psoriasis patients and 64% controls. (P value <0.0001) while the prevalence of insufficiency (<30 ng/mL) was 100% in psoriasis group compared with 80% in control group.

Conclusion: Vitamin D levels are significantly low in psoriasis patients as compared to control group.

Introduction

Psoriasis is a common inflammatory cutaneous disorder. The exact etiology of which remains unknown.[1] Recently, psoriasis is reported to be associated with low levels of vitamin D.[2] This study was conducted to analyze vitamin D status of psoriasis patients in comparison to healthy controls.

Materials and methods

Fifty outpatients; 26 males and 24 females, diagnosed clinically with psoriasis were enrolled in this study. Patients on vitamin D supplement or those having any other autoimmune disease were excluded from both groups. Fifty; 27 males and 23 females, age and sex matched controls

were taken from patients coming for routine health check from general medicine department in our hospital. After an informed consent, blood samples were taken from all the subjects for estimation of levels of vitamin D. Vitamin D was measured using competitive enzyme-immunoassay technique with a selected monoclonal antibody recognizing 25-hydroxy (OH) vitamin D. Vitamin D insufficiency was defined as <30ng/ml and deficiency as <20ng/ml. Mean vitamin D levels were calculated for both groups. Comparison of data between two groups was carried out using 2 sample test, and chi-square test. No correlation was done with type or severity of psoriasis. Odds ratio was estimated to check the association between vitamin D deficiency and psoriasis.

Results

The median age in the psoriasis group was 41 years while it was 42 years in the control group. The mean vitamin D level in patients was 13.55±3.43 ng/ml (Minimum 5.2 ng/ml and maximum 24.1ng/ml) while in controls it was 20.80±14.37ng/ml (minimum 6.4ng/ml and maximum 73ng/ml). The difference was statically significant with P value <0.0001. **(Table-1)**

Vitamin D level	Psoriasis	Control	P-value
Mean±SD	13.55±3.43	20.80±14.37	0.001
Minimum	5.2	6.4	-
Maximum	24.1	73	-

Table 1: Minimum, maximum and mean vitamin D levels in cases and controls

Vitamin D deficiency was seen in 96% psoriasis patients as compared 64% in controls. (P value<0.001) Vitamin D insufficiency was seen in 100 % psoriasis patients compared to 80%in control group. **(Figure-1)**

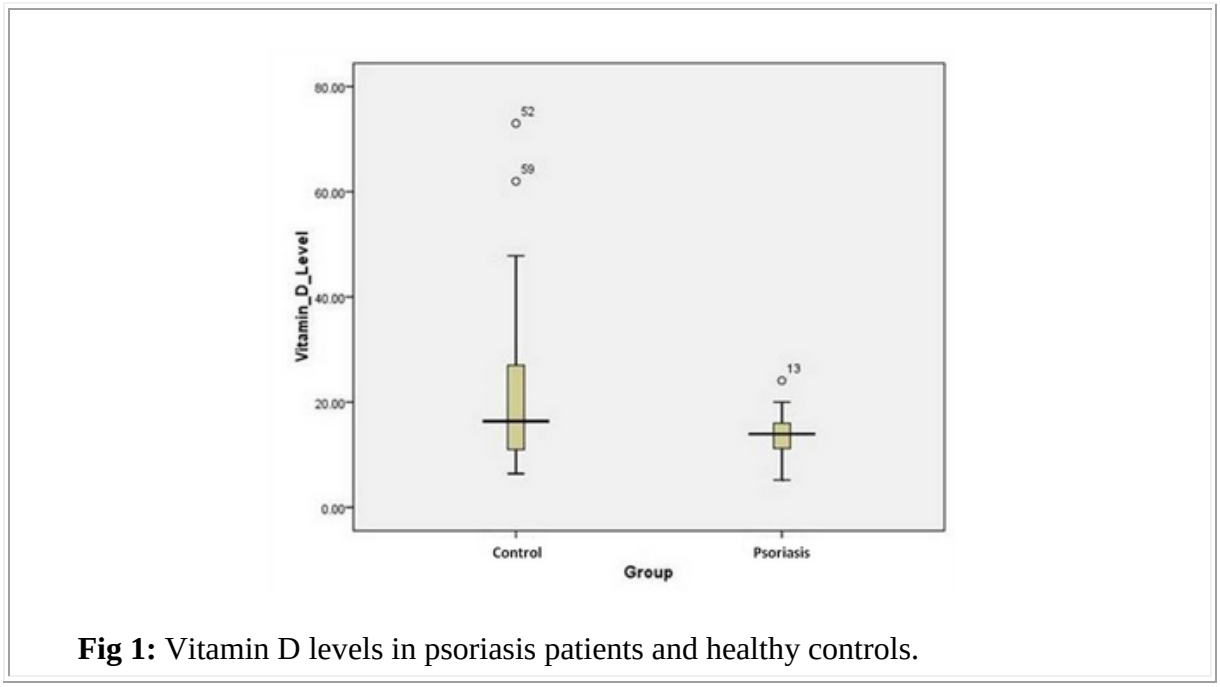

Fig 1: Vitamin D levels in psoriasis patients and healthy controls.

Odds ratio was 27.58 indicating very strong association between psoriasis and vitamin D deficiency.

Discussion

This study shows high prevalence of vitamin D deficiency and almost 100% prevalence of vitamin D insufficiency in patients with psoriasis.

Many observational studies in the past with large cohorts have shown significant associations between vitamin D deficiency and increased risk of diseases like diabetes mellitus, metabolic syndrome and cardiovascular mortality.[3] Similarly, psoriasis is frequently associated with cardio-metabolic co-morbidities and with an increased cardiovascular mortality.[3,4]

Vitamin D3 through vitamin D receptors is known to regulate keratinocyte growth and differentiation. Also it has an influence on immune functions of dendritic cells and T lymphocytes so low levels of vitamin D may also have important implications in the pathogenesis of psoriasis.[5]

Many recent studies have also shown deficiency of vitamin D in psoriasis patients, and the evidence is growing.[6] Also, topical vitamin D derivatives have immunomodulatory effects on monocytes, macrophages, T cells and dendritic cells, and are being extensively used as monotherapy or in combination with steroids for the topical treatment of psoriasis.[7] Moreover, it has been proposed that narrowband ultraviolet (UV) B radiation may mediate its beneficial effect on psoriasis also by increasing endogenous vitamin D levels as phototherapy has been shown to increases the levels of serum vitamin D in patients with psoriasis.[8]

Reduced vitamin D levels have been associated with an increased risk for Th1 cytokine-mediated autoimmune diseases, including multiple sclerosis, inflammatory bowel disease, and rheumatoid arthritis.[9] Also some animal studies demonstrated that 1, 25-dihydroxyvitamin D reduces the symptoms of chronic inflammatory autoimmune reaction.[10]

Vitamin D deficiency in patients with psoriasis may be associated with alterations in isoenzymes that affect the synthesis of vitamin D. Some studies have shown differences in vitamin D receptors polymorphisms between patients with psoriasis and the general population.[11]

Present study showed inverse relationship between vitamin D and psoriasis patients. However our study has limitations like small sample size, and some of the confounding factors like amount of sun exposure, or clothing habits, dietary intake of vitamin D, seasonal variations, body mass index and socioeconomic status etc., could have an influence on the results.

In conclusion, vitamin D deficiency may be common in psoriasis patients. Considering the fact that psoriasis is an inflammatory autoimmune disease and vitamin D has protective role in such diseases, psoriasis patients could be routinely screened for vitamin D insufficiency and oral supplementation with vitamin D might benefit them.

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