



Artikel Penelitian

COMPARISON OF VITAMIN D SERUM LEVELS BETWEEN PSORIASIS VULGARIS PATIENT AND NON-PSORIASIS VULGARIS PATIENTS AT HAJI ADAM MALIK HOSPITAL, MEDAN IN 2015

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ABSTRACT

Background: Psoriasis vulgaris is a chronic inflammatory skin disease that is multifactorial, including genetic factors, immune system defects, environmental and hormonal factors, one of which is a decrease in vitamin D levels. Vitamin D is a fat-soluble vitamin that has a steroid molecular structure. Low levels of vitamin D are associated with the incidence of psoriasis vulgaris. The purpose of this study was to determine the differences in vitamin D levels between psoriasis vulgaris patients and non-psoriasis vulgaris patients.

Method: A case-control study conducted in the Dermato-immunology Division/Department of Dermatology and Venereology, Faculty of Medicine, Universitas Sumatra Utara/Haji Adam Malik Hospital, Medan. There were 11 psoriasis sufferers as cases and nine non-psoriasis sufferers as controls. Measurement of vitamin D levels was carried out using Electro Chemiluminescent Immunoassay (ECLIA). Data analysis using SPSS version 15 with independent t test. P-value <0.05 was considered significant.

Result: The serum vitamin D levels in non-psoriasis vulgaris patients (33.67±2.42) were higher than the serum vitamin D levels in psoriasis vulgaris patients (16.58±6.05). There was a significant difference between both serum vitamin D levels ($p = 0.0001$).

Conclusion: Serum vitamin D levels in psoriasis vulgaris patients were lower than serum vitamin D levels in non-psoriasis vulgaris patients, where the difference in levels is significant.

Keywords: psoriasis vulgaris, vitamin D, serum

BACKGROUND

Psoriasis vulgaris is a common and complex chronic inflammatory skin disease of all ages. Well-defined plaques characterize the disease with thick whitish scales that are symmetrically distributed with predilection in the extremities' extensor areas.¹

Several epidemiological studies estimate psoriasis vulgaris in the world to range from 0.5% to 4.6%. In the United States, about 2% of the population suffers from this disease. Meanwhile, in certain ethnic groups such as Japanese, Australian Aboriginal, and American Indians, the prevalence is lower. During the period 2000 to 2002, 338 psoriasis vulgaris sufferers (2.39%) were found in the Dermatology and Venereology Polyclinic, dr. Cipto Mangunkusumo (RSCM), Jakarta. Of the total psoriasis vulgaris, sufferers found 28% severe degrees, 14% moderate degrees, and 58% mild degrees. Psoriasis vulgaris or plaque-type is the most common type, accounting for 80% of the total cases.^{2,3}

Psoriasis vulgaris is a multifactorial and multi-system disease that involved many systems and organs which all of these factors are interrelated. This disease is associated with genetic factors, immune system defects, environmental and hormonal factors, and a decrease in vitamin D levels.^{2,4,5} Low levels of vitamin D may also have important implications in the pathogenesis of psoriasis vulgaris.⁶⁻⁸ Vitamin deficiency D is common in patients with chronic plaque psoriasis vulgaris and those with psoriatic arthritis. This finding is frequent (i.e., 80% of cases) in winter and about 50% of patients in summer. The association between

vitamin D deficiency and psoriasis vulgaris was independent of age, sex, BMI, Psoriasis Area Severity Index score, Parathyroid hormone and the season in which serum samples were taken.^{6,7}

Although there is no evidence that the benefit of vitamin D supplementation in reducing inflammation or the risk of other incident autoimmune diseases has yet to be proven, Vitamin D deficiency can be corrected.^{7,9} Recent studies have reported vitamin D deficiency can increase the incidence of psoriasis vulgaris. Vitamin D is the only vitamin formed when the skin is exposed to the sun's ultraviolet rays. Vitamin D deficiency generally occurs in people who live in highlands compared to people who live in lowlands. That is due to a lack of intake of ultraviolet sunlight.¹⁰ This study aimed to determine differences in vitamin D levels in patients and non-sufferers of psoriasis vulgaris.

METHOD

Patient and Method

The study used a case-control design conducted in the Dermato Immunology Section of the Skin and Genital Unit of the Faculty of Medicine, University of North Sumatra/Haji Adam Malik Hospital, Medan. There were 11 psoriasis sufferers as cases and nine non-psoriasis sufferers as controls. Patients who came to the Dermatology and Venereology Polyclinic who met the inclusion and exclusion criteria, were the research subjects. After signing the informed concentration, vitamin D levels were measured using the Electro

Chemiluminescent Immunoassay (ECLIA) technique.

Data Analysis

Data analysis was performed using independent t test data on vitamin D levels in serum normally distributed. The difference is considered significant if the P-value <0.05, then the data analysis is processed using the SPSS Version 15 program.

RESULT

Table 1. Comparison of vitamin D serum levels between psoriasis vulgaris patients and non-psoriasis vulgaris patients

Variable	Case		Control		P-value
	N	$\bar{x} \pm SD$	N	$\bar{x} \pm SD$	
Vitamin D serum levels	11	16,58 ± 6,05	9	33,76 ± 2,42	0,0001

*N: Number

It was found that vitamin D serum levels were significantly different between psoriasis vulgaris patients and non-psoriasis vulgaris patients (P = 0.0001). The control group had a higher vitamin D serum level than the case group.

DISCUSSION

In this study, patients with psoriasis vulgaris were deficient in serum vitamin D levels with a mean of 16.8 ng/mL, while in the non-psoriasis vulgaris group, vitamin D levels were found in serum with a mean of 33.76 ng/mL, or it could be said to be expected.

Recent studies have reported that vitamin D deficiency may increase the incidence of psoriasis vulgaris.³ Several studies

have demonstrated that serum vitamin D levels are associated with the incidence of psoriasis vulgaris.¹¹ Low levels of vitamin D have essential implications for the pathogenicity of psoriasis vulgaris. Vitamin D3 acts as the primary receptor for vitamin D to differentiate and regulate keratinocyte growth and influences the immune function of dendritic cells and T lymphocytes. Vitamin D3 inhibits interleukin production (IL)-2 and IL-6 and blocks interferon transcription. - γ and granulocytes-macrophage colony-stimulating factor mRNA and inhibits cytotoxic T cells and natural killer cell activity.^{11,12}

Vitamin D levels are determined by measuring serum 25 (OH) D. A minimum serum concentration of 25 (OH) D of 30 ng/ml (75 nmol/l) is required for beneficial and multifaceted vitamin D effects. Although there is no consensus on the optimal level of 25 (OH) D measured in serum, some experts define 25 (OH) D levels as follows:¹⁰

Table 1. The vitamin D status based on serum 25-hydroxyvitamin D levels

Serum 25-Hydroxyvitamin D (ng/ml)	Status Vitamin D
≤ 10	Severe deficiency
10-20	Deficiency
21-29	Insufficiency
≥ 30	Sufficiency
> 150	Toxicity

CONCLUSION

In patients with psoriasis vulgaris, there was a significant decrease in vitamin D levels compared to vitamin D levels in non-patients with psoriasis vulgaris. To further refine this research, researchers

expect further research to be carried out to see the levels of vitamin D in serum.

DISCLOSURE

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Conflict of Interest

Authors declared no conflict of interest regarding this research.

Author Contribution

All authors have contributed to designing research concepts, taking sample data, analyzing data, and preparing the published manuscript.

Ethical Statement

The Ethical Commission of Faculty of Medicine, Universitas Sumatra Utara, has approved this study.

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REFERENCES

1. Bos JD, De Rie MA. The pathogenesis of psoriasis: immunological facts and speculations. *Immunol Today*. 1999;20(1):40–6.
2. Wiryadi B. Epidemiologic data of psoriatic patient in Dr. Cipto Mangunkusumo General Hospital. In: Psoriasis CLEAR Study Group inaugural meeting. Singapore; 2004.
3. Das RP, Jain AK, Ramesh V. Current concepts in the pathogenesis of psoriasis. *Indian J Dermatol*. 2009;54(1):7.
4. Gudjonsson J, Elder J. Psoriasis Vulgaris. In: Wolff K, Goldsmith L, Katz S, Gilchrest B, Paller A, Leffell D, editors. *Fitzpatrick's Dermatology in General Medicine*. 8th ed. New York: McGraw-Hill; 2012. p. 169–93.
5. Holick MF, Chen TC. Vitamin D deficiency: a worldwide problem with health consequences. *Am J Clin Nutr*. 2008;87(4):1080S-1086S.
6. Gisondi P, Rossini M, Di Cesare A, Idolazzi L, Farina S, Beltrami G, et al. Vitamin D status in patients with chronic plaque psoriasis. *Br J Dermatol*. 2012;166(3):505–10.
7. 25-hydroxy vitamin D test: MedlinePlus Medical Encyclopedia [Internet]. Available from: <https://medlineplus.gov/ency/article/003569.htm>
8. Yu-Lee L-Y. Prolactin modulation of immune and inflammatory responses. *Recent Prog Horm Res*. 2002;57:435–56.
9. Weber G, Neidhardt M, Frey H, Galle K, Geiger A. Treatment of psoriasis with bromocriptin. *Arch Dermatol Res*. 1981;271(4):437–9.
10. Del Valle HB, Yaktine AL, Taylor CL, Ross AC. Dietary reference intakes for calcium and vitamin D. 2011;
11. Schwalfenberg GK. A review of the critical role of vitamin D in the functioning of the immune system and the clinical implications of vitamin D

- deficiency. *Mol Nutr Food Res.*
2011;55(1):96–108.
12. Van de Kerkhof PCM. An update on
vitamin D3 analogues in the treatment of
psoriasis. *Skin Pharmacol Physiol.*
1998;11(1):2–10.