



Research Article

## SEVERITY OF SEBORRHEIC DERMATITIS CORRELATES TO SERUM LEVELS OF 25-HYDROXYVITAMIN D

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### ABSTRACT

Seborrheic dermatitis is a chronic, erythemo-squamous disorder affecting between 3 and 11% of the population worldwide. Many factors like sex, age, season, stress and alcohol consumption influence the severity and natural history of this common dermatological condition. Our previous study showed that patients with exacerbated seborrheic dermatitis show insufficient and deficient levels of serum 25-hydroxyvitamin D (25(OH)D). In present study we investigated the correlation between the serum levels of 25(OH)D and the severity of clinical presentation and frequency of recurrences in patients with seborrheic dermatitis. Results showed that patients with more severe skin condition have lower serum vitamin D levels.

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### INTRODUCTION

Skin functions in health and sickness are regulated by vitamin D. 1,25 (OH)2D induces the expression of involucrin, skin transglutaminases, loricrin and filaggrin and inhibits the proliferation of keratinocytes (1,2). Vitamin D and its receptor regulate processing of long-chain glucosylceramides thus affecting the skin barrier function (3). It also induces toll like receptor 2 (TLR2) and its co-receptor CD14 and initiates innate immunity response in skin (4). It is thought that local synthesis and metabolism of vitamin D may regulate multiple cell functions in sebaceous glands. Incubation of human sebocytes with 1,25 (OH)2D also led to dose-dependent suppression of cell proliferation (5,6). There are certain facts that make pathogenic role of vitamin D in seborrheic dermatitis possible. Summer alleviation and winter exacerbation of seborrheic dermatitis (7,8,9), few studies proving beneficial therapeutic effect of UV-B exposition(10,11) and local application of vitamin D analogs (12,13,14) make us believe that vitamin D influences this skin condition. The aim of our study is to examine the correlation between the serum levels of vitamin D and the severity of seborrheic dermatitis in adult patients.

### MATERIALS AND METHODS

110 patients with exacerbated seborrheic dermatitis aged over 18 years (49 females and 61 males) examined in outpatient dermatology practice for the period 2015-2018.

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Inclusion criteria: Age over 18 years, erythema and scaling of the scalp, seborrheic areas of face, ear canal, retroauricular folds, chests and back.

Medical history was taken and patients were examined for clinical findings. Severity of the clinical presentation was estimated by the presence of erythema and desquamation numerically evaluated as: 0-none, 1-slight and 2-severe for every area of the skin that is affected. The overall score was called severity score of seborrheic dermatitis (table1), varying between 1 and 24.

Table 1 Evaluating the severity of clinical findings (severity score)

	Scalp	Face	External auditory meatus	Retroauricular folds	Chest	Back
Erythema	0-1-2	0-1-2	0-1-2	0-1-2	0-1-2	0-1-2
Scaling	0-1-2	0-1-2	0-1-2	0-1-2	0-1-2	0-1-2
Overall						

Serum level of 25(OH) vitamin D was measured with electrochemiluminescent immune assay (ECLIA) Elecsys 2010 (Roche).

IBM SPSS Statistics software for Windows, version 19.0 was used for statistical data analysis.

### RESULTS AND DISCUSSION

Mean value of serum vitamin D in patients with exacerbated seborrheic dermatitis was 19,35 (±9,5)ng/ml, ranging from 3

ng/ml to 52,37ng/ml. Distribution of the studied patients by age, sex and level of serum vitamin D is shown on table 2.

**Table 2** Distribution of studied subjects by sex, age and serum level of 25(OH) vitamin D

Age groups	Females		Males	
	Females N	Mean 25(OH) D (stand.deviation)	Males N	Mean 25(OH) D (stand.deviation)
<30	21	17,72 (5,87)	22	22
31-40	7	18,49(13,21)	18	18
41-50	8	15,45 (4,62)	12	12
51-60	9	18,36 (5,51)	6	6
>60	4	19,66(12,52)	3	3
Overall	49	17,74 (7,5)	61	61

During all months of the study, mean patients' serum vitamin D level does not exceed the optimal 30 ng/ml. Except June, July and September, patients with exacerbated seborrheic dermatitis show mean serum 25(OH)D under 20ng/ml (87,3% of the studied subjects).

The level of serum vitamin D also correlates with the severity of clinical findings (table3).

**Table 3** Mean severity score according to the value of serum 25(OH) vitamin D

Serum 25(OH) D	Females	Males
	Mean severity score	Mean severity score
<20 ng/ml	6,54	7,9
20-30 ng/ml	3,3	4,3
>30 ng/ml	3	3,8

Females with serum vitamin D under 20 ng/ml have 2,2 times higher severity score compared with those with optimal serum level. The same correlation is found in males (2,08 times higher severity score). Statistically significant negative correlation is established ( $r = -0,56$ ;  $p < 0,0001$ ).

Females with deficient vitamin D levels show 3,5 times higher mean number of recurrences per year while in males the difference is 2,4 times (table4). The same correlation is found in patients with insufficient serum vitamin D levels ( $r = -0,39$ ;  $p < 0,0001$ ).

**Table 4** Mean yearly recurrences number according to the value of serum 25(OH) vitamin D

Serum 25(OH) D	Females	Males
	Mean number recurrences/year	Mean number recurrences/year
<20 ng/ml	7,16	7,28
20-30 ng/ml	4,2	6,5
>30 ng/ml	2	3

In the recent years vitamin D deficiency is thought to correlate to major health problems (diabetes, cardiovascular diseases, breast, prostate and colorectal cancer, inflammatory and autoimmune diseases), independently of whether it is a cause or consequence of those conditions (15). Multiple health outcomes of vitamin D deficiency necessitates establishing the risk groups in which it should be expected. The present study shows that patients with severe clinical presentation and frequent recurrences of seborrheic dermatitis have lower serum vitamin D level. Further investigations may prove the necessity of serum vitamin D measurement in such patients, as the skin condition may be indicative for deficiency that should be adequately substituted.

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