

## Serum levels of 25-hydroxy vitamin D in psoriatic patients\*

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**Abstract:** Studies have shown a relationship between vitamin D and psoriasis. We compared serum levels of vitamin D of 20 psoriasis patients and 20 controls. The median vitamin D level was  $22.80 \pm 4.60$  ng/ml; the median in the cases was  $23.55 \pm 7.6$  ng/ml, and in controls  $22.35 \pm 3.10$  ng/ml ( $p = 0.73$ ). Only 2 cases and 4 controls had sufficient levels of vitamin D, although without statistical significance between the groups ( $p = 0.608$ ). Levels were lower in women with psoriasis compared with those in male patients ( $20.85 \pm 6.70$  x  $25.35 \pm 2.90$  ng/ml,  $p = 0.03$ ), a finding that was not observed among controls.

**Keywords:** Psoriasis; Vitamin D; Vitamin D deficiency

Psoriasis is a systemic, inflammatory, chronic autoimmune disease that affects between 1 and 3 % of the global population.<sup>1</sup> Its pathogenesis is not totally clear, but it is a known fact that there is activation of sectors of innate and adaptive immune response.<sup>2,3</sup>

Vitamina D (25-hydroxyvitamin D) is a hormone whose synthesis is stimulated by cutaneous exposure to ultraviolet B radiation.<sup>4</sup> It acts on calcium homeostasis, on bone metabolism and has immune regulating functions that have been recently recognized.<sup>5</sup> Some studies have demonstrated a relationship between vitamin D deficiency and psoriasis.<sup>6,7</sup>

This study compares serum levels of vitamin D of 20 adults with active psoriasis and 20 patients seen at the outpatient dermatology clinic of the Teaching Hospital of the Evangelical College of Curitiba, in Curitiba - PR, between July and September of 2013. Those patients who were using medications that interfere on vitamin D levels, were undergoing photother-

apy, had inflammatory or disabsortive bowel disease, liver disease, chronic kidney insufficiency and other autoimmune disorders were excluded.

The analysis of vitamin D serum levels was performed by chemiluminescent immuneassay and values  $<20$  ng/ml were considered deficiency, from 20 to  $<30$  ng/ml insufficiency and  $\geq 30$  ng/ml sufficiency.

Statistical data were evaluated by the following tests: Fisher's Exact, Student's t, Mann-Whitney, Spearman and ANCOVA; the values were considered significant when  $P < 0.05$ .

The group of cases was composed of 12 women and 8 men, aged between 19 and 76 years (mean age  $46.40 \pm 14.90$  years) and median disease duration  $42 \pm 108$  months. As to the type of psoriasis, 5/20 had palmoplantar psoriasis and 15/20 psoriasis vulgaris with median PASI (*Psoriasis Area and Severity Index*)  $2.4 \pm 3.6$  and a DLQI (*Dermatology Life Quality Index*) of  $4.5 \pm 6.0$ .

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The control group was composed of 20 patients (14 women and 6 men), aged between 19 and 84 years (mean 47.80±18.86 years).

Table 1 shows demographic data and serum levels of 25-hydroxyvitamin D in the patients. Distributions by gender, age and phototype were not significantly different. Only 2 cases and 4 controls presented sufficient levels of vitamin D. Including all of the participants in the study, the median vitamin D level was 22.80±4.60 and it was lower in those that were exposed to sunlight for less than 30 minutes per day ( $P=0.04$ ).

We did not find significant differences in vitamin D levels between patients with psoriasis and controls ( $P = 0.735$ ). Wilson et al carried out a study using the National Health and Nutrition Examination Survey (NHANES) information base and found, in a group of 5841 individuals, 148 patients with psoriasis that were compared to the 5693 individuals without

the disease. The investigators did not report differences in serum levels or deficiency of vitamin D between the patients with and without psoriasis, with prevalence of deficiency in 33% and 34.9% of the participants with and without the disease, respectively.<sup>8</sup>

Orgaz-Molina et al, however, observed lower serum levels of vitamin D in patients with psoriasis when compared with controls; 25.6% of the individuals with psoriasis and 93% dos controls presented deficiency of this hormone.<sup>7</sup> In the study by Gisondi et al, the participants with psoriasis presented a risk 2.5 times greater of having 25-hydroxyvitamin D deficiency than those without the disease.<sup>9</sup> Ricceri et al found a prevalence of 68% of vitamin D deficiency and 97% of insufficiency in the patients with psoriasis studied, while the percentages found in the control group were 10% of deficiency and approximately 53% of insufficiency of this hormone.<sup>10</sup>

TABLE 1: Comparison of variables studied between the psoriasis group and the control group

Variable	Psoriasis (n=20)	Controls (n=20)	Odds ratio	p
Sex <sup>1</sup>				
Females	12	14	Reference	-
Males	8	6	1.56 (0.42 to 5.76)	0.531 <sup>2</sup>
Current age <sup>3</sup>	46.40±14.90	47.80±18,6	-	0.860 <sup>4</sup>
Phototype <sup>1</sup>				
1-2	10	11	Reference	-
3	4	5	0.88 (0.18 to 4.23)	0.999 <sup>2</sup>
4-5	6	4	1.65 (0.36 to 7,60)	0.704 <sup>2</sup>
Daily direct sun exposure (min.) <sup>5</sup>	25.0±10.0	35.0±100.0	-	0.156 <sup>6</sup>
25-Hydroxyvitamin D <sup>5</sup>	23.55±7.60	22.35±3.10	-	0.735 <sup>6</sup>
Deficiency VD <sup>1,7</sup>	5	4	Reference	-
Insufficiency VD <sup>1,7</sup>	13	12	0.87 (0.19 to 4.01)	0.999 <sup>2</sup>
Sufficiency VD <sup>1,7</sup>	2	4	0.40 (0.05 to 3.42)	0.608 <sup>2</sup>

1. Represented by absolute numbers. 2. Fisher's Exact test. 3. Means and standard deviations. 4. Unpaired Student's t-test. 5. Medians and interquartile deviation. 6. Nonparametric Mann-Whitney test. 7. VD: Vitamin D; Strata defined according to reference values of the laboratory performing serum dosage of 25-hydroxyvitamin D: deficiency (<20ng/ml), insufficiency (>=20 and <30ng/ml) and sufficiency (>=30ng/ml).

TABLE 2: Comparison of men and women with psoriasis

Variable	Female (n=12)	Male (n=8)	Odds ratio	p
Current age <sup>1</sup>	43.50±14.00	50.50±31.00	-	0.537 <sup>2</sup>
Phototype <sup>3</sup>				
1-2	6	4	Reference	-
3-5	6	4	1.00 (0.17 to 5.98)	0.9994
Age of psoriasis onset (years) <sup>1</sup>	38.58±12.41	33.38±27.12	-	0.5892
PASI <sup>5,6</sup>	1.70±3.40	3.20±5.70	-	0.2177
DLQI <sup>5,8</sup>	2.50±3.00	7.50±5.00	-	0.1147
Daily direct sun exposure (min.) <sup>5</sup>	20.0±10.0	45.0±40.0	-	0.0497
25-Hydroxyvitamin D <sup>5</sup>	20.85±6.70	25.35±2.90	-	0.0317

1. Means and standard deviations. 2. Unpaired Student's t-test. 3. Represented by absolute numbers. 4. Fisher's Exact test. 5. Medians and interquartile deviation. 6. "Psoriasis Area Severity Index". 7. Nonparametric Mann-Whitney test. 8. "Dermatology Life Quality Index".

Our study also found association between serum levels of vitamin D and gender. Vitamin D levels were lower in women with psoriasis in comparison with men ( $P=0.03$ ), a fact not observed among controls ( $P=0.62$ ). The median daily sun exposure time was also shorter in women with psoriasis compared with men with psoriasis ( $P=0.049$ ), which also did not occur with controls ( $P=0.99$ ). This association may be due to the relatively small number of cases or some uncontrolled variable, like wearing cosmetics with sunscreen effect, more common among women.<sup>7</sup> In spite of this, the covariance analysis of the group of psoriasis patients, controlled by daily sun exposure

levels, showed that the female gender was associated with lower levels of vitamin D independently from time of sun exposure ( $P=0.01$ ). Table 2 illustrates the characteristics of patients with psoriasis according to gender. The studies conducted by Orgaz-Molina et al and Ricceri et al, which also evaluated these variables, did not find significant differences between vitamin D levels and gender.<sup>7,10</sup>

Vitamin D insufficiency was very frequent in this population, although no significant differences were found in vitamin D serum levels between patients with psoriasis and other dermatology patients. □

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