



## 25 - HYDROXY VITAMIN D LEVELS IN PSORIASIS

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**ABSTRACT** The sunshine vitamin is a hot topic that attracted considerable attention over the past decades. It is said that a considerable number of the worldwide population are deficient in this essential nutrient. Vitamin D is a fat-soluble vitamin and synthesised in the skin from 7-dehydroxy cholesterol during exposure to ultraviolet B radiation. Vitamin D was primarily acknowledged for its role in bone formation. However increasing evidence point to its interference with the primary function of nearly every tissue including brain, heart, muscle, immune system and skin. Thereby it's deficiency has been incriminated in a long panel of diseases including cancers, cardiovascular diseases, schizophrenia, neurological and autoimmune diseases. It's involvement in the pathogenesis of different skin diseases has been the subject of much research over the recent years. In this study we will throw light on the serum levels of 25-Hydroxy vitamin D in psoriatic patients in different environments.

**KEYWORDS :** Psoriasis, Vitamin D deficiency ,autoimmune, immunological, psoriatic area and severity index [PASI].

### INTRODUCTION :

Psoriasis is a chronic, inflammatory, systemic, autoimmune disease that affects between 1 and 3% of the global population<sup>1</sup>. It's 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>. In some of the cases it may be associated with metabolic and cardiovascular disease<sup>4</sup>. In India the prevalence of psoriasis ranges from 0.44 to 2.8%<sup>5</sup>.

Vitamin D is actually a fat-soluble pro hormone that has endocrine, paracrine and autocrine functions<sup>6</sup>. The endocrine effects of Vitamin D are mainly involved in serum calcium homeostasis. Vitamin D and calcium work closely together and Vitamin D permits or facilitates physiologic response to varying calcium needs<sup>7</sup>.

The paracrine and autocrine effects of Vitamin D depends on genetic transcription, unique to the type of cell expressing nuclear Vitamin D receptors. Three potential effects include inhibition of cell proliferation, promotion of cell differentiation and apoptosis which may in turn have roles in cancer, immunity and many organ systems<sup>8,9,10,11,12</sup>.

So many factors have been recognised in the etiology and pathogenesis of psoriasis including family history and environmental factors such as diet, obesity, smoking, stress and alcohol consumption<sup>13</sup>. The ability of dietary antioxidants such as omega3polyunsaturated fatty acids from fish oil, some vitamins A,E,C and oligoelements [copper, manganese, zinc, selenium], which decreases stress, might be of particular relevance in diseases like psoriasis<sup>14</sup>. In addition due to its role in the proliferation and maturation of keratinocytes, Vitamin D has become an important therapeutic option in the treatment of psoriasis<sup>14</sup>. Vitamin D is a hormone and it's synthesis is stimulated by skin exposure to ultra violet B radiation<sup>15</sup>. It acts on calcium homeostasis, bone metabolism and has immune regulatory functions that have been recently recognised<sup>16</sup>. Some studies have demonstrated a relationship between Vitamin D deficiency and psoriasis<sup>17,18</sup>. Previous studies on the relationship of diet and nutrition with psoriasis have focused on either individual nutrients [fishoil,omega-3 fatty acid, Vitamin B 12, Vitamin D, Vitamin A selenium, inositol, zinc and antioxidants] or individual food groups (Fruits, Vegetables and Fish)<sup>17,19</sup>.

Although the role of Vitamin D in psoriasis was established long before, there are very few studies in south India. Hence the present study was conducted to analyze Vitamin D levels in psoriasis.

### Methodology.

Study design- A comparative hospital based study

**Study setting-** OPD of ASRAM Medical College, Eluru.

**Study duration-** July 2015 to June 2016.

**Sample technique-** convenient sampling.

**Sample size -** cases 60. Controls 120[age and sex matched].

**Inclusion criteria.** 1.patients older than 18years,who were clinically diagnosed as psoriasis.2 who were willing to participate in the study.

**Exclusion criteria.** 1) Patients less than 18 years, 2) Pregnancy and lactation, 3) Patients on Systemic corticosteroids, 4) Topical or UVB therapy within previous 4 weeks, 5) Puva or laser phototherapy within previous 6 weeks, 6) Other systemic therapies or biologicals within previous 12 weeks, 7) Patients on Vitamin D supplements, 8) Having other autoimmune diseases.

**Investigations.** After obtaining the consent from patients, blood samples were drawn from all patients and controls.

Electrochemiluminescence method was used to analyse serum hydroxy Vitamin D levels. Mean Vitamin D levels were calculated for all groups and recorded as units NG per ml.

### RESULTS :

**Table – 1: Sex Distribution**

	PSORIASIS N=60	CONTROL N=120
MALE	34 (56.6)	68 (56.6)
FEMALE	26 (43.4)	52 (43.4)
Total	60 (100)	120 (100)

In cases males were 34 and females were 26 where as in controls males were 68 and females were 52. The mean age of onset of Psoriasis is 44.6± 9.22 years. In males it is around 46.1± 8.12 years and among females it is 45.4±5.32 years.

**Table – 2: Serum Vitamin D levels**

GROUP	MINIMUM	MAXIMUM	MEAN	P Value
PSORIASIS N=60	9	33	26.98±6.92	Significant
CONTROL N=120	24	44	35.72±7.30	

**Table – 3: Vitamin D levels Based on Gender distribution**

vitamin D levels	PSORIASIS N=60		P VALUE
	Male	Female	
	27 ± 6	25 ± 8	N.S

Total 180 participants were included in this study. Of these 60 were cases of psoriasis and 120 were age and sex matched controls. The mean Vitamin D levels in cases recorded is 26.98 with a minimum of 9 and maximum 33. In controls the mean Vitamin D levels recorded is 35.72 with minimum of 24 and maximum 44.

Out of the cases the mean Vitamin D value in males is 27 and the mean Vitamin D levels in females is 25.

**Table – 4: Vitamin D levels Based on PASI Score Index**

PASI SCORE	PSORIASIS N=60 (Mean ± SD)
MILD	32.8±2.60
MODERATE	31.21±1.54
SEVERE	20.86±3.39
VERY SEVERE	16.04±4.26

The severity of psoriasis is measured with the psoriasis area and severity index (PASI) score. It is a scale that takes into account the area of lesion coverage (calculated as the percentage of the effected body surface area) as well as plaque appearance (Redness, thickness and scaling).

It is estimated and graded from 0 to 6.

- 0 → 0%
- 1 → less than 10% of involved area.
- 2 → 10 to 29% of involved area.
- 3 → 30 to 49% of involved area.
- 4 → 50 to 69% of involved area.
- 5 → 70 to 89% of involved area.
- 6 → 90% to 100% of involved area.

These six grades are classified in to 4 categories

- 1. Mild - 0 to 1 grades.
- 2. moderate - Grade 2 and 3.
- 3. severe - Grade 4 and 5.
- 4. very severe - Grade 6.

The mean Vitamin D levels in mild category is 32.8.  
 The mean Vitamin D levels in moderate category is 31.21.  
 The mean vitamin d levels in severe category is 20.86.  
 The mean vitamin d levels in very severe category is 16.04.

**Table – 5: Risk Factors**

	PSORIA SIS N=60 N(%)	Mean serum Vit D values	CONTR OL N=120 N(%)	Mean serum Vit D values	P VALUE SIG*,SIG **
Alcohol Consumption PRESENT	28(46.6)	23.49 ± 5.6	15(25)	32.6±4.32	SIG ,SIG
Obesity	25(41.6)	21.43 ± 6.67	10(16.6)	31.9±4.40	SIG ,SIG
Smoking	18(30)	23.09 ± 8.76	16(26.6)	31.8±7.61	SIG ,SIG

\* Z TEST, \*\*T-Test

Vitamin D levels are less in severe and very severe cases when compared with mild and moderate cases .Severe and very severe cases are found to have a statistically significant different average Vitamin D values when compared with the control group average Vitamin D value, with P values less than 0.05.

The mean Vitamin D levels in alcoholic cases is 23.49 and controls is 32.6.

The mean Vitamin D levels in obesity cases is 21.43 and controls is 31.9.

The mean Vitamin D levels in smoking cases is 23.09 and controls is 31.8.

Very low levels of Vitamin D were observed in Psoriatic cases with above risk factors when compared to controls with risk factors.

**Table – 6: Seasonal Variation among Psoriasis patients**

Seasonal Variation	PSORIASIS N=60	Mean serum Vit D values	P Value
MARCH -JUNE	21(35)	25.92 ±7.12	N.S <sup>#</sup>
JULY – OCTOBER	17(28.3)	28.6± 8.08	
NOVEMBER - February	22(36.7)	25.4 ±5.23	
Total	60(100)		

<sup>#</sup>ANOVA-Analysis of Variance test.

The mean Vitamin D levels in March to June season is 25.92.

The mean Vitamin D levels in July to October season is 28.6.

The mean Vitamin D levels in November to February season is 25.4.

There is no significant difference in mean values of serum Vitamin D levels among psoriasis patients based on seasonal variation. When compared with the above mean values with the overall mean value of serum Vitamin D levels in psoriatic patients, the difference thus obtained is not statistically significant.

**DISCUSSION:**

In the present study we find that there is significant Vitamin D deficiency in patients with psoriasis when compared to controls. Wilson et al carried out a study using the national Health and nutrition examination survey [NHANES] , which reported no differences in serum levels or deficiency of Vitamin D between patients with and without psoriasis, with a prevalence of deficiency in 33% and 34.9% of the participants with and without disease respectively<sup>20</sup>.

Orgaz-Molina et al, however observed lower serum levels of Vitamin D in patients with psoriasis when compared to controls<sup>18</sup> which correlates with our study. In the study by Gisondi et al , the cases with psoriasis presented a risk of 2.5 times greater of having 25- hydroxy Vitamin D deficiency than those without the disease<sup>21</sup>. Ricceri et al found a prevalence of 68% of Vitamin D deficiency and 97% insufficiency in cases and 10% deficiency and 53% insufficiency in controls<sup>2</sup>.

Though some studies found significant decrease in Vitamin D levels in women, our study found no significant association between Vitamin D levels and gender in cases. This correlates with the study conducted by Orgaz-Molina et al and Ricceri et al<sup>18,20,21,22</sup>.

Gisondi et al<sup>21</sup> found that Vitamin D deficiency is more common in winter, but we found no seasonal variations in Vitamin D levels. Marques et al<sup>16</sup> explored Vitamin D deficiency related to autoimmunity. Morimoto et al<sup>23</sup> detected less circulating Vitamin D in patients with severe psoriasis, which correlates with our study.

In our study low Vitamin D levels were found in psoriatic cases associated with risk factors like obesity , smoking and alcohol consumption when compared to controls. Till to now there are few studies regarding these factors and it needs further study and research .

**CONCLUSION:**

Vitamin D deficiency is more common in patients with psoriasis . It is more common in severe psoriatic cases . Vitamin D deficiency is not confined to any particular seasons. Therefore patients could be routinely screened for vitamin D levels for a more significant and accurate management.

**Sponsorship - Nil**  
**Conflicts of interest - Nil.**

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