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Serum concentration of vitamin D in patients of psoriasis.

Biochemistry

KEYWORDS: Psoriasis, Serum 25-hydroxy vitamin D.

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ABSTRACT

Many autoimmune diseases have been associated with deficient serum 25-hydroxy vitamin D (25-(OH) D) level. Psoriasis now being proved as an autoimmune disease was analyzed for serum 25-(OH) D i.e. vitamin D. This was a case control study comprising of 35 patients of psoriasis and 35 normal controls. Serum vitamin D was estimated in both the groups, which showed a significant decrease in patients of psoriasis as compared to controls. Also the level seems to decrease significantly with increase in severity of psoriasis. So every psoriatic patient must be investigated for vitamin D and supplemented if found deficient or insufficient.

INTRODUCTION

Psoriasis is a long lasting auto-immune disorder characterized by erythematous scaly patches over extensor aspects of the body [1]. It affects about 2-3% of world population. According to World Psoriasis Day consortium about 125 million people all over the world suffer from this disease [2]. It is characterized by abnormal cycle of epidermal development, with epidermal hyperproliferation, altered skin cell maturation, vascular changes and inflammatory features. It is concluded that environmental factors including β hemolytic streptococci infection and multiple genetic components may be responsible for the pathogenesis of the disease [3]. Histological studies of psoriatic lesions have shown leucocytes infiltration, namely by T lymphocytes and neutrophils [4].Recent studies suggest that psoriasis, like atherosclerosis, is an autoimmune disease. The clinical manifestation of both diseases includes inflammation which appears to be driven by Tcell cytokines characteristic of the T-helper cell response. The activation of the immune system in psoriasis cause changes in patient's lipid profile [5].

Vitamin D refers to a group of fat-soluble secosteroid responsible for increasing intestinal absorption of calcium, iron, magnesium, phosphate, and zinc[6].Two main forms of vitamin D are vitamin D_2or ergocalciferol which is derived from plant source and contributes 10% of vitamin D .The other major form is vitamin D_3 or cholecalciferol which contributes 90% of vitamin D and is synthesized from 7 dehydro cholesterol from skin on exposure to ultraviolet B radiation. In the circulation it

is hydxoxylated twice to form calcitriol, the active form of vitamin D[7].Vitamin D without a subscript refers to either D_2 or D_3 or both. These are known collectively as calciferol[8].

These two specific vitamin D metabolites are measured in serum to determine a person's vitamin D status [9,10].

Various studies have shown the association of reduced vitamin D level and increased risk for Th1 cytokine-mediated autoimmune diseases, including atherosclerosis, multiple sclerosis, inflammatory bowel disease, rheumatoid arthritis and chron's disease[11].

Vitamin D has significant role in regulation of immune system as vitamin D receptors (VDRs) and CYP271B (enzyme responsible for 25-hydroxyvitamin D synthesis) are present in large number of tissues. VDRs are present on activated T lymphocytes and are known to regulate growth and differentiation of keratinocytes, immune functions of dendritic cells and T lymphocytes [12].

10%-50% of Vitamin D of food is destroyed while cooking, the exact rate depend on cooking process[13].

MATERIAL AND METHODS

The present study was carried out in Department of Clinical Biochemistry, IGIMS, Patna in collaboration with the Department of Dermatology. Thirty five cases of psoriasis who attended the outpatient Department of Dermatology for the first time for this disease were taken as case. Psoriasis patients were grouped as mild, moderate and severe using Psoriasis Area Severity Index (PASI). A PASI score below 3 is "mild," between 3 and 10 is defined as "moderate," and above 10 is defined as "severe" disease (according to British Association of Dermatologists Guidelines) [14].Serum level of vitamin D was estimated in these patients.

Control group consist of age and sex matched thirty five healthy paramedical staff, volunteers and patients attending skin outpatient department for cosmetic problems like acne and pigment disturbances. Serum level of vitamin D was estimated in these subjects also.

Age group ranging from 15-50years was included in the study for both the groups.

Patients with any systemic illness like diabetes, hypertension, obesity, family history of hyperlipidemia, renal and liver failure, endocrine disorders, were excluded from the study in both case and control groups. Patients with all clinical forms of psoriasis were included in study.

The purpose of the study was explained and informed consent was obtained from all respondents.

After an informed consent, blood samples were taken from all the subjects for estimation of serum levels of vitamin D. Mean vitamin D levels was calculated for both groups.
25-hydroxy (OH) vitamin D was estimated using chemillumine-scence Access 2 Beckman coulter. Serum vitamin D level
≥30ng/ml was considered sufficient while
<30ng/ml was considered as insufficient and
<20ng/ml as deficient (15).

Statistical analysis

Statistical analysis was performed using Graph pad Prism (version 5.0). Data obtained were presented as mean ± SD. Results of the study was discussed at 95% confidence interval. Interpretation of the test results was done according to P value. ($P < 0.05$ is significant).

Result

This study enrolled a total of 70 subjects of which 35 were patients of

psoriasis in group I and 35 were normal controls in group II. The mean age of psoriasis patients and that of control was 30.31±10.10 and 32.00±9.95 with p value 0.48. These 35 patients of psoriasis were graded by senior dermatologist according to the PASI score as mild, moderate and severe. Out of 35 psoriasis patients 20 were mild and 15 were of severe type. None of these patients were of moderate type. Mean serum level of 25-(OH) vitamin D in group I and II was 15.58 ±6.51 and 25.29 ± 9.12 respectively with p=0.0001 as shown in table I. Values of serum level of 25-(OH) D was compared among mild and severe group of psoriasis patients . Serum level of 25-(OH) D showed a significant decrease in level with increase in severity or grade of psoriasis with p=0.003 as shown in table II. Vitamin D deficiency was noted in 62.85% psoriasis patients as compared 11.42% in controls. None of the patient in group I had vitamin D level above 30ng/ml while 34.28% had sufficient level in group II.

Table I: Comparison between cases and controls with respect to serum 25-(OH) D

Parameter	Case group (n=35)	Control group (n=35)	P value
25-(OH)D (ng/ml)	15.58±6.51	25.29±9.12	P<0.0001

Table II: Comparison between mild and severe psoriasis with respect to serum 25-(OH) D

Parameter	Psoriasis patient (n=35)		P value
	Mild(n=20)	Severe (n=15)	
25-(OH)D (ng/ml)	18.25±6.72	12.02±4.22	0.003

Discussion

Psoriasis is a dermatological condition associated with various comorbidities.

There could be various reasons for vitamin D deficiency in patients of psoriasis. Osteoporosis is a well known disease associated with vitamin D deficiency. Increased risk of osteoporosis in male psoriatic patients has been reported by Dreiher J et.al. [16].

Similarly various studies have shown the association of vitamin D deficiency and death due to cardiovascular disease [17]. Psoriasis has also been associated with cardiovascular mortality as shown in various study [18].

Phototherapy is recommended in patients of psoriasis. There are various reasons behind it. One of this is that narrowband UV-B effectively increases serum 25-(OH) D while it clears psoriasis which was shown by Ryan C et.al [19] in his study.

25-(OH) D through VDR (vitamin D receptor) influences the immune function of dendritic and T cell. Also VDR influences the growth and function of keratinocytes. So 25-(OH) D may have a crucial role in etiopathogenesis of psoriasis [20].

Our study matched with Latha Srirama [21], Jacinto orgaz-Molina et.al. [22], Rameshwar

M. Gutta et.al. [23] who also showed significant decrease in vitamin D level in patients of psoriasis as compared to controls. None of the study has shown significant correlation of decreasing 25-(OH) D level with increasing severity of psoriasis as seen in our study. Seeing decreasing trend of 25-(OH)D with increasing grade of psoriasis, vitamin D must be investigated in patients of psoriasis attending the clinic for the first time so that deficient patient may be supplemented with vitamin D so as to slow the progress of the disease. However more extensive studies are needed to establish the fact that vitamin D supplementation in early grade of psoriasis prevent further progress of disease.

Conclusion

From this study it is concluded that psoriatic patients are deficient in vitamin D. Also there is significant decrease in level with increasing severity. So all psoriatic patients must be supplemented with vitamin D which would prove beneficial to them.

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