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Assessment of 25-Hydroxyvitamin D in Serum of Psoriatic Sudanese Patients:A Case-Control Study

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ABSTRACT

Some autoimmune conditions have been associated with reduced vitamin D levels, has been associated with vitamin D insufficiency. Reports showed that serum 25-hydroxyvitamin D levels are inversely associated with chronic inflammatory systemic diseases. The main objective of this study was to estimate 25-hydroxyvitamin D level in patients with psoriasis in comparison with control subjects without this disease. Total of 188 (90 male and 98 female) patients with psoriasis were selected and included in the study. Eighty non-psoriatic individuals (40 male and 40 female) with different ages were included as controls.Levels of 25-OH vitamin D were determined using ELISA test kits (Euroimmun-Germany). serum concentrations of vitamin D were significantly lower in psoriatic patients than in control 19.52±10.03 pg/ml, and 40.39±9.06 pg/ml, respectively. The mean of duration of the disease was 13.08±10.5. The mean age of patient was 33.7±14.6 and of control group was 28.0±7.4. There is insignificant difference between concentrations of vitamin D in female compared to male 21.8±10.7 and 17.2±8.9, respectively, *P*=0.143. Insignificant correlation was found between duration of disease concentration of Vitamin D, *P*=0.259. The finding of this study showed that the hypovitaminosis Dwas associated with psoriasis disease in Sudan. Gender and duration of the disease were not associated with vitamin D level.

Keywords: Psoriasis, vitamin D, autoimmune disease, Sudan

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INTRODUCTION

Psoriasis is a chronic multisystem disease with predominantly skin and joint manifestations [1]. It is an immunologically mediated skin disease affecting the skin, hairs, nails and joints [2]. The world-wide estimated prevalence of this common skin disease is around 2% [3]. Psoriasis affects both genders equally. It can strike at any age, although it commonly appears between the ages of 15 and 35. Approximately 10 to 15 percent of people with psoriasis get it before age 10 [4]. Psoriasis has been associated with vitamin D insufficiency. Reports showed that serum 25-hydroxyvitamin D (25-OHD) levels are inversely associated with chronic inflammatory systemic diseases[5].There are five types of psoriasis[6]:

- Plaque: Most common form of the disease, in which patches of skin become inflamed and are covered by silvery, white scales
- Guttate: Appears as small red spots on the skin
- Inverse: Occurs in armpits, groin and skin folds
- Pustular: White blisters surrounded by red skin
- Erythrodermic: Intense redness over large areas

Psoriasis generally appears as patches of raised, red skin covered by flaky, white buildup of dead skin cells. These patches, or plaques, most often appear on the scalp, knees, elbows and torso. They are often itchy and painful, and they can crack and bleed [1]. The chronic, long-lasting character of psoriasis, along with its physical, psychological and social repercussions, constitutes difficulties in controlling the disease [7]. Studies have not shown a direct link between vitamins and dietary supplements and psoriasis.Yet many patients find that including vitamins and supplements in their diet helps their skin clear and may ease joint pain from psoriatic arthritis[8]. Epidemiological data have also confirmed that vitamin D deficiency may be a risk for development of autoimmune diseases including rheumatoid arthritis (RA), multiple sclerosis, systemic lupus erythematosus and Crohn disease[9, 10]. Data is scarce regarding psoriasis in our country (Sudan) but it is assumed (on basis of daily out-patients department attendance) to be a common problem. Hence, the aim of present study was to estimate vitamin D in psoriasis Sudanese patients.

MATERIALS AND METHOD

During the period from February 2014 to August 2014 at Khartoum Hospital for Dermatology and Venereal Diseases-Khartoum-Sudan, a total of 188 (90 male and 98 female) patients with psoriasis were selected and included in the study. Patients with other chronic diseases which might have relation with vitamin D deficiency were excluded from the study. Patients selected were age matched with 80healthypersons (40 male and 40 female) included as controls. Patients age was more than 8 years with various grades of severity. The

study was approved by Al-Neelain University Ethics Committee and all subjects gave informed consent (Based on Helsinki Declaration), the informed consent was signed by them. Patient's information's were collected by a structured questionnaire. (The form induced the importance of the research, and we informed the participant that there is no hazard for them and the data gained will not be used for any study except the current study). Venous blood (5 ml) was drawn in sterile syringe, and serum was separated by centrifugation. Levels of 25-OH vitamin D was estimated using ELISA test Kits (Euroimmun-Germany).

Statistical Analysis

Statistical evaluation was performed using the Microsoft Office Excel (Microsoft Office Excel for windows; 2007) and SPSS (SPSS for windows version 19). Normal distribution of the studied variables was examined using t-tests. Unpaired T-test and Mann-Whitney U test were used to assess significant difference in the means of the studied variables in patients and control.

RESULTS AND DISCUSSION

The mean of age of control group was 28.0±7.4 years, matched with age of psoriasis patient (33.7± 14.6), $P>0.05$.

Levels of 25-OH vitamin Din serum of patientswith psoriasis were significantly lower (19.52 ± 10.03 ng/mL) compared to control (40.39± 9.06ng/mL), ($P<0.05$), table 1. Females with psoriasis have lower levels of vitamin D (17.2±8.9 ng/ml) compare to male (21.8±10.7ng/ml), but this difference didn't achieve statistically significant value ($P= 0.143$), table 2. Correlation analysis revealed insignificant correlation between the duration of the disease and vitamin D level (r=0.163, p=0.259).

Table 1: Mean of age and vitamin D in study population

Variable	Study group		P.value
	Patients	Control	
Age (years)	33.7±14.6	28.0±7.4	0.34
Vitamin D (M ± SDng/ml)	19.5±10.0	40.3±9.0	0.001

Table 2: Mean of age and vitamin D in patients according to gender

Variable	Gender		P.value
	Male	Female	
Age (years)	36.7±16.7	30.6±11.8	0.142
Vitamin D (M ± SDng/ml)	21.8±10.7	17.2±8.9	0.143

The finding of this study showed that the hypovitaminosis D was associated with psoriasis disease in Sudan; this is in agreement with other studies done worldwide[11, 12]. The association between vitamin D deficiency and psoriasis was confirmed independently of age and sex, this finding of vitamin D deficiency in patients with psoriasis could be relevant for several factors. One of these factors is the established relation between vitamin D deficiency and

osteoporosis[13]. An increased risk of male patients with psoriasis developing osteoporosis has been addressed[14]. Another factor is the fact that psoriasis is frequently associated with cardiovascular disease[15]. Also significant associations between low levels of vitamin D and increased risk of diabetes mellitus, metabolic syndrome and cardiovascular mortality had been reported[16].Low levels of vitamin D may also have important implications in the pathogenesis of psoriasis. Vitamin D regulates keratinocyte growth and differentiationso,topical vitamin D derivatives are extensively used as monotherapy or in combination with steroids for the topical treatment of psoriasis[17]. Vitamin D3 analogues have revolutionized the topical treatment of psoriasis during the last decade.Vitamin D3 analogues cause inhibition of various aspects of cutaneous inflammation and epidermal proliferation with enhancement of normal keratinization[18]. The current study revealed no significant correlation found between vitamin D levels and duration of the disease. Females with psoriasis have lower levels of vitamin Dcompare to male, but this difference didn't achieve statistically significant value, this finding is in agreement with Orgaz-Molina J et al study [19]. The data of this study confirmed that patients with psoriasis have lower levels of vitamin D, but further study with larger sample size is required to confirm if correction of vitamin D deficiency by giving supplement would result in significant improvement in patients with psoriasis.

CONCLUSION

This study confirmed that concentrations of vitamin D werelower in patientswith psoriasis than healthy individuals. This does not significantly affected by gender and duration of the disease.

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