

# Alopecia Areata and Serum Vitamin D in Iraqi Patients: A Case-Control Study

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## Abstract

**Background:** Alopecia Areata (AA) is a typical hair issue, which may have obliterating mental and social outcomes and is portrayed by the nearness of nonscarring alopecia.

**Objective:** This examination has targets to assess the serum nutrient D levels, with AA; contrast the outcome and clearly sound control; and confirm relationship between AA types and serum nutrient D levels.

**Patients and Methods:** the examine might have been led clinched alongside Tikrit educating healing facility throughout those time starting with June 2019 of the limit for January 2020. Irrefutably the quantity of subjects associated with the assessment was ninety individuals isolated in two social events; the patients bundle were forty five the people who whimper of AA while the resulting gathering including a forty five age and sex-made solid volunteers were picked as a benchmark gathering. The degree and movement of the alopecia were noted and the patients were meticulously broke down for signs of various ailments. Research center assessments were led to patients and also to those control population, these included serum vitamin D levels were measured as 25-hydroxyvitamin D {25(OH)D} using a chemiluminescence micro particle immunoassay. Blood models were gotten starting with patients and control subjects after totally taught consent was gotten.

**Results:** An essential complexity may have been found for serum 25-OH Vitamin D levels between patients other than controls. Vitamin D sufficiency were more common in controls than in patients. Serum Vitamin D was deficient in both cases and controls group; but, the deficiency was significantly more throughout AA group (35. 6%) compared to the handle group (11. 1%). Among the list patients gathering, levels associated with nutrient D were totally higher in guys in contrast with females.

**Conclusions:** AA might be related with nutrient D deficiency as mean degrees of nutrient D of patients were seen as fundamentally lower than typical sound controls.

**Keywords:** Alopecia Areata (AA); Alopecia Areata Totalis (AT); Alopecia Areata Universalis (AU); 25-Hydroxyvitamin D {25(OH)D}; Venereal Disease Research Laboratory Test (VDRL); The Treponema pallidum Haemagglutination Test (TPHA); The Antinuclear Antibody Test (ANA); Anti-double Stranded DNA ( anti-ds-DNA); Diabetes Mellitus (DM); Rheumatoid Arthritis (RA); Systemic Lupus Erythematosus (SLE)

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## Introduction

Alopecia areata (AA) is the most well-known reason for irritation intervened male pattern baldness influencing roughly 0.1-0.2% of everyone, with a lifetime danger of 2% [1]. Alopecia areata (AA) is a typical hair issue, which may have crushing mental and social outcomes and is described by the nearness of non-scarring alopecia [2].

Alopecia areata may clinically give a single or possibly couple round or even oval patches of men example sparseness on the particular scalp or any various other hair-bearing zone from the entire body.

Alopecia areata may in like method present as a band-like alopecia on the occipital scalp or even diffuse alopecia, and can progress to be able to lost all terminal curly hair on the scalp totalis (AT) or lack all scalp and curly hair AA universalis (AU) [3].

Trademark hairs, known as “exclamation perspective hairs,” might be seen inside or around those territories from claiming alopecia. The

hairs would decreased at the scalp end for thickening toward those distal end. Hair draw tests led during the fringe of the lese greatness might make emphatically corresponded (six hairs alternately more) for illness movement [4].

The pathophysiology of AA is indistinct and a few lines of proof help the theory that AA is an organ-explicit immune system ailment with hereditary inclination and an ecological trigger [5]. Numerous hypotheses have been created with respect to the charge of AA since its depiction by Sauvages within 1760. At long last, during the 1960s, the autoimmunity speculation picked up fame. The thought of autoimmunity in AA is maintained by the substantial pace of relationship together with other safe mediated afflictions like vitiligo and thyroiditis, and the reaction observed to safe altering prescription drugs [6].

Nutrient D3 has been known as the ‘daylight’ nutrient in light of the fact that the arrangement of nutrient D is intervened by introduction of



daylight. Expanded sun based bright (UV) presentation is legitimately identified with expanded nutrient D creation. Accordingly, over 90% of people get their nutrient D necessity by easygoing introduction to daylight [7].

In keratinocytes and other cellular sorts, 1,25(OH)<sub>2</sub>D<sub>3</sub> oversees advancement and separation. Consequently nutrient D analogs have been presented for the remedy of the hyper proliferative skin malady psoriasis. As of overdue, sebocytes had been outstanding as 1,25(OH)<sub>2</sub>D<sub>3</sub>-responsive goal cells, exhibiting that supplement D analogs is most likely convincing inside the treatment of acne. Other new components of supplement D analogs remember significant impacts for the resistant framework just as in different tissues insurance against malignancy and different ailments, including immune system and irresistible sicknesses. It very well may be expected that dermatological suggestions on sun assurance and wellbeing efforts for skin malignancy anticipation should be rethought to ensure an adequate nutrient D status [8].

Nutrient D assumes a significant job at the same time as the guideline about affecting safe framework moreover the multiplication and differentiation of keratinocytes and sebocytes. It has been entangle in the origination and development of a disease and therapy of numerous dermatological matter, for symbol, psoriasis, atopic dermatitis, vitiligo, acne vulgaris as well as alopecia areata [9].

Since nutrient D is basic considering encouraging the torso's reaction to couple corporeal along with conceivably unsafe boosts, depressed nutrient D situation expands effective danger as concern numerous interminable sicknesses. Our own selves won't have striking genuine weight in this regard ailments before privately reestablish populace equivalent nutrient D position through farcical specimen height a well-known won for the time being advancement as concerns personal functions and activities of life [10].

## Patients and Methods

Precise assent was seized in distinction to every patient affected role after full clarification about the chance of the present appraisal and a moral endorsing was earn from the Scientific Ethical Committee of Tikrit University College of Medicine.

The investigation was directed in Tikrit Teaching Hospital all the while duration from June 2019 as far as possible of January 2020. All patients were inspected clinically, then interviewed and detailed questionnaires were completed for each of them. Those analysis about AA might have been made for fact from claiming historical backdrop furthermore physical examination.

The hard and fast total of proposal associated with the questioning was ninety individuals isolated in two social events; affecting patients assortment were forty five effective human being who gripe of AA meantime the consecutive collection counting forty five an age and sexuality-facilitated strong enlist were picked as a criterion gathering none of these gave a history of increased hair loss or had alopecia clinically.

## Inclusion Criteria

Know patients for an AA not getting any medicine to AA for at any rate a half year before incorporation in the investigation.

## Exclusion Criteria

- All patient catching supplement D complement, iron courses

of action, supplement B, folic destructive or calcium (Ca) complement over the latest a half year; systemic corticosteroid therapy and previous systemic therapy; immunosuppressive agents, phototherapy during last one year, pregnant and lactating women, have autoimmune disorders, sarcoidosis, renal disease, malignancy and malabsorption were excluded from study; Patients with any associated disease and chronic systemic disease.

- Systemic and/or scalp disease that might be related to hair loss.
- Patients with different reasons for male pattern baldness, for example, androgenetic alopecia, telogen effluvium, tinea capitis, cicatricial alopecia were barred from the study. Patients with recurrent AA and those already on treatment for AA were excluded.

The level of scalp male example hairlessness was directed by isolating the scalp within 4 portion, trailed aside ostensibly choosing the degree about scalp male example sparseness current any portion and including the statistic well-adjusted, alongside a most outrageous account of one hundred percent. The percent was settled by the reality of alopecia earnestness in alopecia instrument (severity of alopecia tool score) amount [11]. Scalp male pattern baldness (S) was named pursue: S0=no male pattern baldness; S1=25% male pattern baldness; S2=25-49% male pattern baldness; S3=50-74% male pattern baldness; S4=75-99% male pattern baldness, a=75-95% male pattern baldness, b=96-99% male pattern baldness; and S5=100% male pattern baldness. Patients were grouped by the seriousness of AA in the direction of: mellow AA-patients which obtain S1; mild AA-patients which obtain S2; and extreme AA-patients which obtain S3, S4 and S5. Patients were additionally characterized by the example of AA through to inconsistent AA or broad AA [alopecia totalis/alopecia universalis (AT/AU)].

Additionally, patients were arranged by length of the malady into patients inside a half year or over a half year.

All subjects study gave a solitary blood test at the main daytime belonging to the assessment, along with serum nutrient D height were estimated as 25-hydroxyvitamin D {25(OH)D} utilizing a chemiluminescence micro particle immunoassay.

Nutrient D height were grouped considering a spellbinding examination as per American Endocrine Society criteria as adequate ( $\geq 30$  ng/mL), inadequate (21-29 ng/mL), or insufficient ( $\leq 20$  ng/mL) [12].

Other investigations included complete haemogram, liver function, kidney function, thyroid profile, VDRL, TPHA, ANA and anti-ds-DNA was done whenever indicated.

The factual investigation of the information was finished utilizing understudies t test for the distinction of means, chi-square test and Fisher's accurate test for proportions. These tests were referenced for p esteems and p estimation of under 0.05 was taken to be noteworthy.

## Results

The segment information and clinical information of patients and control are delineated in table 1.

Forty five patients and forty five sound people were selected in this body of evidence control contemplate who met those consideration criteria of this consider. The age range of cases and controls in our study was 10-50 years with mean age of  $35.53 \pm 7$  years in cases and  $33.2 \pm 8$  years in controls which was not statistically significant. There were 29 (64.4%) guys What's more 16 (35.6%) females in the situations



**Table 1:** Segment and clinical information of the considered gatherings.

Factors		Sufferers (n = 45)	Controls (n = 45)	P esteem < 0.05
Age (years)	Range	10-50	12-49	Not significant (P = 0.1450)
	Mean ± SD	35.53 ± 7	33.2 ± 8	
Gender, n (%)	Males	29 (64.4%)	28 (62.2%)	Not significant at p < 0.05
	Females	16 (35.6%)	17(37.8%)	
Duration of disease, n (%)	<6 months	20 (44.4%)		
	>6 months	25 (55.6%)		
Severity of AA, n (%)	S1(Mild)	14(31%)		
	S2 (Moderate)	31 (69%)		
	S3+S4+S5 (severe)	0		

**Table 2:** Connection the middle of those examined bunches Likewise respect Vitamin D Supplement height.

Nutrient 25(OH)D		Sufferers	Controls	P esteem < 0.05.
Gender mean ± SD	Males	29.02±19.64	24.2±19.04	Significant (P = 0.0456) only between patients
	Females	17.03±16.81	20.24±16.81	
Duration of disease, (ng/mL)	<6 months	13.25±4.08	not significant (P = 0.4315)	
	>6 months	12.34±3.60		
Nutrient D level (ng/mL), n (%)	Sufficient (≥30 ng/mL)	15 (33.3%)	24 (53.3%)	not significant (P = 0.0569)
	Insufficient (21-29 ng/mL)	14 (31.1%)	16 (35.6%)	not significant (P = 0.6525)
	Deficient (≤20 ng/mL)	16 (35.6%)	5 (11.1%)	significant (P = 0.0063)
Vitamin D (ng/ml): mean ± standard deviation		22.24±15.81	29.5±14.08	significant (P = 0.0238)

**Table 3:** Relationship between mean 25-hydroxyvitamin D esteems with seriousness of AA in guys and females.

Severity of AA	S1 (Mild AA)		S2 (Moderate AA)		Total	P value < 0.05
	No. n(%)	Mean nutrient D (ng/ml)	No. n(%)	Mean nutrient D (ng/ml)		
Male	8(27.6%)	26.3±17.5	21 (72.4%)	21.9± 9.8	29 (64.4%)	Not significant (P= 0.3957)
Female	6(37.5%)	24.6±8.4	10 (62.5%)	21.8±7.6	16 (35.6%)	Not significant (P= 0.5034)
Total	14(31%)	23.2±6.5	31(69%)	20.7±9.2	45	Not significant (P= 0.3647)

What's more 28 (62.2%) guys and 17 (37.8%) females in the control bunch. Contrast was not measurably critical among cases and controls.

The duration of hair disease below 6 months were 20 (44.4%) and 25 (55.6%) over 6 months duration.

Amongst 45 patients of alopecia areata, 14 (31%) had mild alopecia areata, 31 (69%) had moderate alopecia areata and we did not get any cases of Alopecia Totalis (AT), Alopecia Universalis (AU) or Ophiasis.

Table 2 reveals to a foremost contrast might have been discovered previously, serum 25-hydroxyvitamin D levels around patients Furthermore controls (P<0.05). Nutrient D adequacy and inadequacy were more typical in controls than in patients however the thing that matters was not factually huge among cases and controls.

Serum Vitamin D was inadequate in the two cases and controls gathering; be that as it may, the lack was altogether more in AA gathering (35.6%) contrasted with the benchmark group (11.1%).

Amidst the patients gathering, height of nutrient D abide essentially higher mod guys contrasted with females, while in control bunch no huge distinction was found among guys and females. Serum 25-OH Vitamin D levels were a considerable measure of more level clinched alongside female parts over in male parts in the two get-togethers. There was no measurably critical relationship between serum 25(OH) D levels and term of the sickness in patients with AA.

Table 3 shows the patients with moderate type of AA tend to have lower serum vitamin D however, they were statistically not significant.

According to our findings, serum Vitamin D level was found to be 23.2±6.5 ng/mL in mild AA, levels dropped to 20.7±9.2 ng/mL in moderate AA. Constant drop was noted also in serum Vitamin D levels when correlated with the gender of alopecia areata and severity type of AA although the difference was not statistically significant.

## Discussion

AA may be viewed as will make a T-cell-mediated autoimmunity happening for hereditarily predisposed people. Perplexing cooperation's the middle of predisposing hereditary and Ecological elements prone help the incitement for immune-mediated reactions done AA [13].

The dynamic type of nutrient D, 25-hydroxyvitamin D, has to play with modulation impacts on the inherent and adaptive immune arrangement. Nutrient D restrains the arrangement of dendritic cells including diminishes T-cell enactment. Moreover, nutrient D has been accounted for to be included in restraining Th1 differentiation, yet in addition in creating resistance to auto-antigens, expanding CD4+ CD25+ regulatory T-cell action [14]. An association between some immune system maladies, including Type 1 diabetes, Rheumatoid arthritis, Systemic lupus erythematosus, vitiligo, psoriasis, multiple sclerosis (MS), inflammatory bowel disease (IBD), and nutrient D inadequacy acquire been accounted for. The present discovering recommends a particular Vitamin D insufficiency could be an Ecological generate for those incitement of autoimmunity [15].



The effect of vitamin D deficiency on causation of AA seems to be associated mainly through its role in immune system regulation. Vitamin D causes shift of TH1 immune response to TH2 response. It also suppresses proinflammatory TH17 response, therefore decreasing the production of proinflammatory cytokines (IL-17 and IL-21). It may also suppress B cell proliferation. Therefore, vitamin D deficiency leads to loss of self-tolerance. AA is predominantly TH1 reaction interceded sickness, in this manner nutrient D insufficiency may assume a causative job [16]. Studies have indicated that nutrient D insufficiency was progressively regular in psoriatic patients and in vitiligo [17]. Another examination has demonstrated that sickness seriousness of rheumatoid arthritis connects with nutrient D insufficiency. Nutrient D substitution has improved SLE in another investigation [18].

Right now, assessed aggregate of 45 AA patients and surveyed their serum nutrient D (25-Hydroxyvitamin D (25(OH)D)) level. Then, we compared those level for serum vitamin D from claiming AA patients with that of age and sex matched coordinated solid controls. Mean period of case and control bunches were similar, number of male and female were also comparable between case and control group.

In this study, data of ninety subjects (forty five cases and forty five matched controls) was included and analyzed. In our study was the majority of the cases were males 64.4%. Comparable male power was additionally found by Yilmaz N, et al. (2012) [19], Aksu Cerman A, et al. (2014) [20], Attawa EM, et al. (2016) [21] and Soheila N, et al. (2013) [22]. Mean age of subjects in cases and controls was found to be  $35.53 \pm 7$  years and  $33.2 \pm 8$  years respectively. Findings of this study was not quite similar to another study from India [23]. In that study, the subjects were two hundred subjects (one hundred cases and one hundred matched controls) that may explain the difference of our result.

In the introduce examination, AA patients shown generally decreased about serum supplement D level contrasted with controls. This is in concurrence with different investigations [19,20,22,24]. In the present examination lower levels of nutrient D were more as often as possible found in female patients as opposed to guys in the two gatherings. Inside the case gathering, there were huge contrasts in regards to serum 25(OH)D levels and the sexual orientation. Similar to this, different examinations [20,22] revealed that serum height of nutrient D were reduced in female AA patients and controls, aforementioned might be expected to by the restricted presentation of females to daylight because of strict and social concerns.

We observed a drop in serum Vitamin D aligned between mild and moderate AA and also between the gender patients. Furthermore, no significant correlation was found between severity of AA, disease duration and nutrient D levels. aforementioned bolstered by Yilmaz N, et al. (2012) [19] and d'Ovidio R, et al. (2013) [24] which discovered no association betwixt those convergences of 25(OH)D, 1,25(OH)2D3 Also different analytic criterion counting degree of the male design baldness, ailment compass furthermore number for patches. Another examination likewise found no critical contrasts among the patients with various examples of male pattern baldness together with their serum groupings of 25(OH)D [22]. In the inverse a progressing report card by Aksu Cerman A, et al. (2014) [20] found an foremost rearward association between low 25(OH)D levels Also reality for AA Concerning illustration for every salt scores. There might a chance to be a couple clarifications for this unpredictability the middle of these examinations. There might be methodological varieties. Serum 25(OH) D displays extraordinary regular variety. Various components

can impact serum nutrient D levels, and few have been assessed or investigated in logical examinations.

An investigation of the circulation of serum nutrient D inadequacy among cases and controls indicated a factually critical higher level of nutrient D lack among cases than in controls. The level of nutrient D insufficiency in southern India was assessed to be about 40%-70% [25]. It is advantageous to make reference to that different investigations which have assessed nutrient D insufficiency when all is said in done populace have utilized distinctive cut-offs to characterize nutrient D inadequacy. A few investigations have characterized values under 35 ng/mL as insufficiency [26].

There are certain potential limitations of this study like small sample size. More studies on this subject with larger cohorts are certainly warranted. Secondly, patients may be followed up after replacement of vitamin D for their severity scores. In conclusion AA might be related with nutrient D lack as mean degrees of nutrient D of patients were seen as fundamentally lower than ordinary solid controls.

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