

## Role of 8-Hydroxydeoxyguanosine in Patients with Alopecia Areata

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### Abstract

Alopecia areata (AA) affects both sexes with a cumulative lifetime incidence of about 2% and no significant racial predominance. The condition is known to carry a considerable impact on health-related quality of life. To evaluate serum level of 8-Hydroxydeoxyguanosine (8-OHdG) in patients with alopecia areata and to assess its clinical significance. Study that included 50 patients suffering from AA. In addition, 30 apparently healthy individuals of matched age and sex as a control group. All patients were selected from the outpatient clinic of Dermatology, Andrology, and Venereology Department of Benha University Hospitals. All patients were subjected history taking. Clinical examination and serum level of 8-OHG. The mean age of AA was 30.7±11.4 years old and the majority of the patients were males. The serum level of 8-OHG was significantly higher among AA patients than in control group and the difference was statistically significant (P-value =0.018). In addition, 8-OHDG showed fair diagnostic accuracy for the detection of AA. At cut off value of 18.1ng/ml, it has a sensitivity of 70% and a specificity of 60% for diagnosis of AA. We found that the serum level of 8-hydroxy-2'-deoxyguanosine (8-OHdG) was significantly higher in AA patients than healthy controls. In addition, serum 8-OHDG is a promising diagnostic and prognostic biomarker for AA. We found that serum 8-OHDG had fair diagnostic accuracy for the detection of AA presence and severity.

**Keywords:** 8-Hydroxydeoxyguanosine, 8-OHG, Alopecia areata.

### 1.Introduction

Alopecia areata (AA) is a type of non-scarring Hair passing influencing anagen phase hair follicles with An multifactorial immune system pathogenesis and an obscure etiology. It influences something like 2-3% from claiming new patients going to dermatology clinics, displaying an extensive variety for clinical heterogeneity [1].

Mossycup oak situations from claiming alopecia areata resolve spontaneously inside 1 year, Yet dependent upon 25% create under extreme types for example, such that alopecia totalis What's more alopecia universalis. Medications for AA would still constantly produced Furthermore researched, What's more hopefully will furnish a suitability medication to alopecia later on [2].

AA might as a rule make effortlessly diagnosed. However, whether the analysis may be unclear, a scalp biopsy might be gainful Furthermore show excellent histopathologic features for AA. AA could available with other immune system infections for example, thyroiditis Furthermore atopy. Various lines from claiming proof also recommended there is imparted hereditary danger figures between AA What's more different immune system infections for example, such that rheumatoid joint inflammation Also sort i diabetes. AA need likewise been discovered will bring An significant sway over An health-related caliber of life (HRQoL) [3].

To a few decades, there need been expanding confirmation linking oxidative anxiety will a few Ceaseless diseases, including cardiovascular diseases, diabetes, neurodegenerative disorders, incendiary diseases, What's more malignancy. It need likewise been indicated that oxidative anxiety assumes a paramount.

### 2.Aim of the study

The aim of the present study is to evaluate serum level of 8-Hydroxydeoxyguanosine (8-OHdG) in patients with alopecia areata and to assess its clinical significance.

### 3.Patients and methods

In this Case control study, Patients were selected from Dermatology clinic of Benha University Hospitals, from October 2016 to February 2017. The study included 50 patients with different clinical variants of AA; (Group A). In addition, 30 apparently healthy individuals of matched age and sex had been chosen as a control group (Group B).

#### 3.1 Inclusion criteria

Diagnosis of AA was based on clinical examination and dermoscopy. The present study included: Patients with different clinical varieties of AA (patchy alopecia, Ophiasis, alopecia totalis and alopecia universalis); Patients with different degrees of severity of alopecia areata according to SALT score; Patients suffering from alopecia areata who are either not treated before by either topical or systemic treatments or stopped treatment for at least two weeks before the start of the study.

#### 3.2 Exclusion criteria

Patients with other autoimmune diseases and diabetic patients and Pregnant female patients.

#### All patients were subjected to the following:

- Full history taking
- Complete general examination
- Local examination of skin: Sites, number, morphology and configuration of AA lesions were recorded and Presence of nail involvement.

- Grading : Severity of AA lesions was assessed using Severity of Alopecia Tool Score (SALT score) [7].
- Serum level of 8-OHdG.

An informed consent was obtained from patients or patient's parents if the patient was less than 18 years old. The study was approved by the ethics committee on research involving human subjects of Benha faculty of Medicine.

### 3.3 Statistical analysis

The collected data were tabulated and analyzed using SPSS version 16 software (Spss Inc, Chicago, ILL Company). Categorical data were presented as number and percentages while quantitative data were expressed as mean  $\pm$  standard deviation, median, range and inter quartile range (IQR). Chi square test (X<sup>2</sup>) was used to analyze categorical variables. Continuous data were tested for normality using Shapiro-Wilks test assuming normality at  $P > 0.05$ , using student "t" test for normally distributed variables while Man Whitney U test, Kruskal Wallis test (KWT) and Spearman's correlation coefficient (rho) were used for non-parametric variables. ROC curve was used to determine cutoff values.

### 4. Results

The present study included 50 patients with AA and 30 controls of apparently healthy individuals.

There was no statistically significant difference between patients and control groups regarding both age and sex ( $P$ -value =0.056) ( $P$ -value=0.056) Table (1)

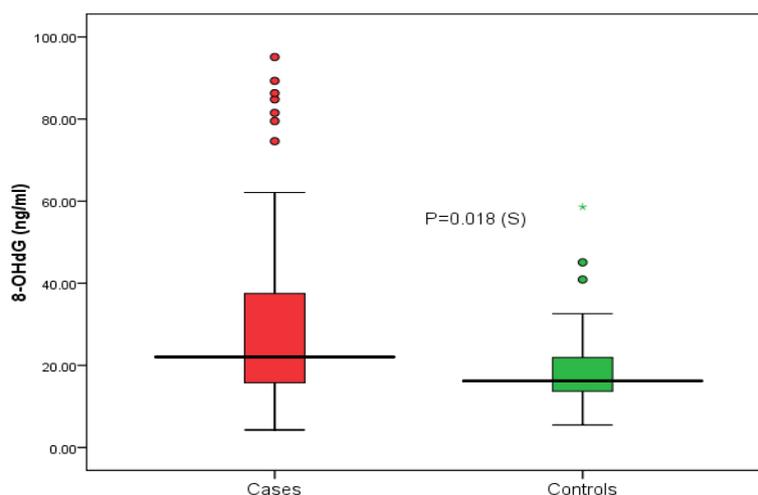
The course of the disease was constant in (52%) 26 patients while it was progressive in (48%) 24 patients. The mean duration of the disease was 8.4 months SD  $\pm$ 12.3. Fifteen patients (30%) weren't suffering from psychological stress. Twenty nine patients (58%) were not receiving previous treatment. Family history was negative in (84%) 42 patients.

On examination, The pattern of loss of hair was patchy in (84%) 42 patients, ophiasis in (8%) 4 patients, alopecia totalis in (4%) 2 patients and alopecia universalis in (4%) 2 patients. The mean number of patches was 2.0 patches  $\pm$  SD 1.8. The mean of average size of patches was in dimension1 (D1) 2.4 cm  $\pm$  1.3 and in dimension2 (D2) 3.1 cm  $\pm$  1.9. Exclamation mark hairs were found in (13%) 6 patients. According to SALT score there was 3 patients (6%) S0, 34 patients (68%) S1, 6 patients (12%) S2, 4 patients (8%) S3 and 3 patients (6%) are S5. Nail pitting wasn't found in 41 patients (82%).

The serum level of 8-OHdG was significantly higher among AA patients than in control group and the difference was statistically significant ( $P$ -value =0.018), table (1), Fig (1).

**Table (1)** Comparison of serum level of 8-OHdG between studied groups

	Patient (N=50)		Control (N=30)		P
	Mean $\pm$ SD	Median (IQR)	Mean $\pm$ SD	Median (IQR)	
<b>8-OHdG (ng/ml)</b>	21 $\pm$ 11.3	22.4 (16.2-31.5)	7.1 $\pm$ 5.2	16.2 (15.5-20.2)	0.018 (S)



**Fig (1)** Box plot showing the median and inter quartile range (IQR) of 8-OHdG.

### 5. Discussion

In spite of AA could create during whatever age,

the vast majority people create AA to those To begin with run through When the agdistis for 30. On the

different hand, past investigations indicated no sex predominance clinched alongside AA. In addition, patients for AA reporting weight An family history of the illness have been assessed between 0% What's more 8. 6% [8]. In the exhibit study, the mean period from claiming AA might have been 30. 7±11. 4 a considerable length of time of age and the dominant part of the patients were guys. The predominance for family history might have been 16% also.

In line with our findings, tan What's more associates [9] performed a cross-sectional should contemplate those epidemiology, clinical aspects, associations, Also medicine of AA On an asian number In a 1-year time. Two hundred Furthermore nineteen new situation referrals about AA were seen starting with might 1998 on april 1999. The average period In presentation might have been 25. 2 quite some time. However, those creators news person an easier pervasiveness of family history of AA (4. 6%).

Similarly, Furue Also associates [10] led An nationwide, cross-sectional, seasonal, multicenter contemplate to elucidate the predominance of skin issue "around dermatology patients clinched alongside japan. Around 67,448 cases, those larger part from claiming AA patients were the middle of 20-30 quite some time of age.

While, Kavak Furthermore partners [11] pointed with research those demographic Furthermore clinical qualities about AA to turkish patients What's more incorporated 539 AA patients. The male to female proportion might have been 1. 6:1. Sure family history might have been recognized over 10. 1% of the patients. Intense alternately unending anxiety might reason AA development, same time AA itself might make optional stress, prompting a horrendous cycle [12]. In the introduce study, 70% of the patients needed An history of mental stress.

The scalp will be the A large portion normal site for association On AA, with or without inclusion of different particular figure locales (such Similarly as those eyebrows, eyelashes, Furthermore beard). In addition, upon 1st presentation, the dominant part of grown-up patients required patchwork bedcover hair reduction for less half those scalp involved; same time alopecia totalis Furthermore universalis happened in couple rate of AA cases [13].

In the display study, the design from claiming misfortune might have been patchwork bedcover clinched alongside 84%, Ophiasis On 8%, totalis clinched alongside 4%, and universalis clinched alongside 4%; for a imply number of patches of 2 ±1. 8. In understanding with our findings, Guzmán-Sánchez Also partners [14] performed An prospective examine should determine the profile What's more example from claiming AA Previously, An mexican number. Those downright number about new situations about AA seen toward those facility Throughout this time might have been 187 patients. The The majority usually encountered example of hair misfortune might have been patchwork bedcover design.

For addition, Masmoudi and partners [15] meant on survey the effect from claiming AA on the nature from claiming an aggregation. Fifty patients diagnosed for AA seen in the Branch for dermatology from claiming Hedi Chaker school Hospital, the middle of Walk 2010 What's more july 2010, were included. Eighty percent needed patchwork bedcover alopecia Furthermore 8% required alopecia totalis.

Shout point hairs (a kind from claiming dystrophic hairs) need aid a magic trademark from claiming AA and need aid not typically seen done sound controls. On the different hand, AA could include those nails, abnormalities about which would watched On regarding 10–15% from claiming instances alluded to a dermatologist Also up to 44% to a portion populations[16].

In the display study, outcry mark hairs were found in 13% of the patients, same time nail pitting might have been discovered over 18% about them.

Likewise, Sharma Also partners [17] news person the predominance about nail progressions in 1000 north Indians with AA. Those pervasiveness for nail pitting might have been 14%. Baruah and Bhattacharaya [18] recruited 100 successive patients with AA should analyze for vicinity for nail abnormalities. Nail pitting might have been found clinched alongside 24% of the patients.

Viewing those grade results of the display study, we discovered that the serum level about 8-OHdG might have been essentially higher "around AA patients over over control aggregation and the Contrast might have been statistically huge (P-value =0. 018). Over addition, 8-OHDG indicated reasonable symptomatic precision to those identification of AA. Toward cut off worth about 18. 1ng/ml, it need An affectability about 70% and An specificity from claiming 60% to finding for AA.

Of the best for our knowledge, this may be those initial in-vivo examine that evaluated those part of serum 8-OHDG in the pathogenesis from claiming AA What's more its potentials as symptomatic biomarker. However, past investigations need demonstrated those critical commitment for oxidative anxiety in the pathogenesis from claiming AA.

For example, Bakry Also associates [19] pointed should figure out those oxidative stress list (OSI) Furthermore lipid peroxidation by mulling over serum downright oxidant ability (TOC), downright cell reinforcement ability (TAC), Also malondialdehyde (MDA) qualities over AA patients. The consider incorporated 35 AA patients What's more a control aggregation comprising of 30 age- What's more sex-matched solid volunteers. The mean serum TOC (p < 0. 001), MDA (p < 0. 001), Furthermore OSI (p < 0. 001) values were discovered should be altogether higher for AA patients over in the control aggregation.

Similarly, Akar What's more associates [20] investigated those status about oxidative anxiety in the scalp for patients with AA Eventually Tom's perusing measuring the levels of thiobarbituric corrosive

sensitive substances (TBARS) as lipid peroxidation status, superoxide dismutase (SOD) What's more glutathione talk (GSH-Px) Similarly as cell reinforcement proteins in the scalp of ten patients for AA Furthermore ten control subjects. Those creators discovered helter skelter turf Also GSH-Px exercises in the scalp of tolerant for AA.

On addition, Ashrafi Heidarloo and Adışen [21] evaluated the part of oxidative anxiety in the pathogenesis about AA. Those consider incorporated two bunches comprised from claiming 15 patients with AA and An control gathering about 26 sound subjects. The level for no What's more turf might have been fundamentally expanded in the tolerant bunch contrasted with solid controls.

## 6. Conclusion

In conclusion, the current study supports the association between oxidative stress and the development of AA. In the present study, we found that the serum level of 8-hydroxy-2'-deoxyguanosine (8-OHdG) was significantly higher in AA patients than healthy controls. In addition, serum 8-OHdG is a promising diagnostic and prognostic biomarker for AA. We found that serum 8-OHdG had fair diagnostic accuracy for the detection of AA presence and severity. Nevertheless, further studies are still needed to confirm our findings.

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