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Serum 3 alpha diol G level evaluation in female patients with Acne vulgaris

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Abstract

Objectives: to evaluate the serum level of 3 alpha diol G in patients with Acne Vulgaris (AV). Background : AV is a clinical sign of Cutaneous Hyperandrogenism (CHA), one of the most frequent endocrine disorders in women of reproductive age .Women referred to the endocrine clinics for skin sym ptoms of hyperandrogenism (HA) should undergo laboratory work up; to evaluate hormone measurments and receive anti androgen therapy. Materials and methods: This study included 20 female patients with AV presented to the Outpatient Clinic of Dermatology and Andrology Department of Benha University Hospitals between March 2021 and September 2021 and 20 healthy female volunteers were included in this study. The serum 3 alpha diol G was measured by ELISA method. Results: The current findings confirmed that there was statistically significant difference between patient group and control group as regard to the 3 alpha diol G levels. Conclusion: The 3 alpha diol G may have arole in the etiopathogenesis of AV.

Key words: Acne vulgaris, Hyperandrogenism, Cutaneous Hyperandrogenism, 3 alpha diol G.

1. Introduction

Classically, Acne Vulgaris is associated with CHA. Serum androgen levels are usually normal in people with CHA. It is estimated that 5% to 10% of women of reproductive age suffer from hyperandrogenism or androgen excess. Patients with polycystic ovarian syndrome (PCO) are more likely to develop HA. Health care providers and clinical researchers alike have a difficult task in diagnosing patients with haemorrhagic fever (HA). [2]

androgen-induced increased sebum production, altered keratinization, inflammation and bacteria colonisation of hair follicles on the face, neck, chest and back by propionibacterium acnes are all factors that contribute to Acne Vulgaris.[3]

The ovaries, adrenal glands, and skin and fat all produce androgen in women. Male hormones are naturally present in women's bodies. These include DHEA, DHEA-S, androstenedione, testosterone, and dihydrotestosterone (DHT) [4]

As a biochemical activity marker for androgens in the prostate-specific hormone (PSU), 3 alpha diol G is the primary metabolite of 5 alpha reductase that represents peripheral activity of the 5 alpha reductase enzyme [5].

Female patients with AV were compared to healthy controls in terms of serum 3 alpha diol G levels.

2. Subjects and Methods

2.1. Subjects

This comparative cross-sectional case- control study included twenty female patients in the child bearing age between 15 and 50 years. This study was contucted between March 2021 and September 2021.After taking an informed consent that was approved by the Research Ethics Committee of Benha Faculty of Medicine, all participants were classified into the following groups:

Group A: included 20 patients with AV

Group B: included 20 age and sex-matched healthy female volunteers as control.

Any female below the age of 15 years or above 50 years pregnant, lactating females were excluded from the study. Any female suffering from any systemic diseases and those taking contraceptives and other medications were also excluded.

2.2. Methods

All individuals were subjected to the following

I-History taking

Personal history included name, age, relation to stress and diet. Present history was assessed as regards to the onset, course and duration of the current dermatological disease. Patients were also assessed for past history of any illness and were asked about family history of the same dermatological disease, other dermatological disease and systemic diseases.

II-Clinical assessment of the dermatological disease

Height, weight and body mass index (BMI) was calculated for each female.

Global Acne Grading System (GAGS) was done to assess for acne severity. [6]

III-Evaluation of the serum levels of 3 alpha diol G

Five mL venous blood samples were obtained through sterile venipuncture, without foaming. Samples were centrifuged at 1500 revolutions per minute for 10 minutes, serum samples were kept under -20'c till the time of run of the assay. Repeated freeze/thaw cycles were avoided.

serum 3 alpha diol G was measured by its commercially available kits (ELISA kits) .

Assay range: 5 ng/dl -1500 ng/dl.

2.3. Statistical analysis

All data were collected, tabulated and statistically analyzed using Statistical package for social science program for windows (SPSS) version 25 (SPSS incorporation, Armonk, New York :IBM Corporation)

Continuous data were checked for normality by Shapiro Wilk test. Descriptive data were presented as percentage (%), mean and standard deviation (M+_SD). For analytical data, we used Student test, ANOVA, Chi-Square test, Fisher's exact test,

Correlation analysis and ROC curve (receiver operating characteristic).

The corresponding P value for each test was directly computed by the microprocessor, in which we used the one call test values:

Non –significant difference when P >0.05

Significant difference when P <0.05

3. Results

The females in the 2 studied groups were selected to be age matched as much as possible. Therefore, non-significant statistical difference was found between 2 groups as regards to age (p=0.32).

Table (1) the severity among the AV group was assessed using GAG score and demonstrated.

		AV n=20	
		mean	**SD**
GAG score		26.6	7.8
		N	**%**
Grade	**mild**	5	25%
	moderate	9	45%
	severe	6	30%

Table (2) the validity of 3 alpha diol G level for discrimination between AV cases and control groups is demonstrated.

	AV
AUC	0.705
Cut off (pg/mL)	88.2
Sensitivity (%)	80
Specificity (%)	80
PPV (%)	80
NPV (%)	80
Accuracy (%)	80

AV showed significantly higher 3 alpha diol G level when compared to the control group (median=124.9 ng versus control 86.1 ng ; p=0.026)

4. Discussion

The sebaceous gland is the primary location for the manufacture of a variety of hormones and the expression of their associated receptors, particularly androgens. Sebocytes are the primary location of 5--reductase and aromatase metabolism of sex-hormones. [7]

When the levels of the C19 androgens (dehydroepiandrosterone [DHEA], dehydroepiandrosterone sulphate [DHEAS], androstenedione (AS), and testosterone (T) in the blood are abnormally high, it is referred to as hyperandrogenism. HA in women is often caused by an increase in C19 steroid androgen production in the adrenal and/or ovarian glands. HA is often linked to a hormonal imbalance. [8]

Common persistent inflammation of the pilosebaceous system is Acne Vulgaris. Stress and even mental health issues may be caused by acne since it is so frequent among adolescents. [5]

We found that patients with acne had statistically significant increases in 3 alpha diol G levels, which were also shown in earlier research [9,10].

AV patients had a statistically significant rise in 3 alpha diol G levels compared to the control group (p0,001), a recent research found.

The same research [5,9,10] also agreed with our findings that there is no connection between the severity of acne and these factors.

In contrast, a research [11] found that AV was solely linked to a low level of 3-diol G. DHT has been shown to have a role in the development of seborrhea and acne in several studies; but the authors believed that other androgens such as AS and total testosterone (as well as DHEA, DHEAS) are responsible for the condition.

AV individuals in this research [12] all had normal levels, according to another study.

In AV, 3 alpha diol had an 80 percent diagnostic sensitivity and an 80 percent diagnostic specificity.

This is just a preliminary investigation. Acne vulgaris patients will be included in a larger research to validate the findings here and establish the metabolite 3 alpha-diol G as a diagnostic routine in instances of these disorders. This study serves as a beginning.

5. Conclusion

3 alpha diol G may have a function in the development of AV.

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