Assessment of Serum Level of VASPIN in Acne Patients

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Abstract

Background: Acne vulgaris is a prevalent chronic skin condition with pilosebaceous blockages and/or inflammation (hair follicles and their accompanying sebaceous gland). Aim: to investigate vaspin levels in serum of acne sufferers in comparison with normal controls and to link their levels with the severity of the illness. Methods: 30 instances of AV and 31 healthy control groups have been examined and each patient has been submitted to comprehensive history; complete clinical examination and levels of serum vaspine were calculated. Methods: Results: The level of vaspin was much greater in the AV group than the control group (medium=2785.2 vs 155.4 against p<0.001). For discriminating between AV patients and control groups, the Vaspin level receiver operating characteristic curve (ROC) has been performed. Vaspin exhibited o.989 AUC. At a cut-off of 212.2, sensitivity was 96.7%, the specificity of 96.8%, 96.7%, NPV was 96.7% and the accuracy of 96.8%. ROC Vaspin-level curve has been performed for discriminating between mild to moderate and severe AV patients. Vaspin exhibited o.93o AUC. At a cut-off value of 3,911.5, sensitivity was 9%, the specificity was 9%, PPV was 81.8%, NPV was 94.7%, and accuracy was 9%. Conclusion: The level of Vaspin in the AV group was considerably greater than that of the control group with 96.7% susceptibility and 96.8% characteristics. Adipose and severity of AV were linked substantially with a greater vaspin level; the Vaspin level was proposed as a separate AV susceptibility and severity predictor.

Keywords: VASPIN, Acne, vulgaris, VAP.

1. Introduction

Acne vulgaris is a prevalent illness that affects 8% of persons between the ages of 11-3 and 5% of senior adults. Acne is produced and characterised by several variables such as: activity in propionic bacteria acnes; increased production of sebum; androgenic stimulation; follicular hypercornification and lymphocytes; inflammatory responses to macrophage and neutrophin. [1].

Comedones, papules, nodules and often scars, characterise acne vulgaris. Scar is a common complication in patients who are susceptible to scar. Close examination of acne skin in strong light may show scarring in up to 90% of individuals who visit a dermatologist but who have severe scarring in about 22%. Post-acne scars include superficial macular scars, ice picks, rolling scars, boxcar scars, hypertrophic scars and keloid types. [2].

Acne is a chronic systemic multifactorial illness. Elevated levels of serum lipids and of homocysteine in microcirculation, peripheral tissues, and peripheral circulation may cause inflammation. The 78-kDa vaspine is part of a family of serine protease inhibitors and has a regulatory function in glucose and lipid metabolism. (Shikata K and al., 2000). Vaspin has originally been extracted from Tokushima Fatty (OLETF) pig Otsuka Long-Evans, an animal type II diabetes model with abdominal obesity, insulin resistance, hypersensitivity and dyslipidaemia[3].

Vaspin was then assessed in several illnesses, such as mellitus diabetes, heart diseases, and liver diseases. Vaspin, protein 1 (VAP-1) vascular adhesion, is an inflammatory biomarker. Nevertheless, the function of this marker in Acne's aetiology remains unclear. Vaspin, VAP-1, was examined in the serum of acne sufferers and healthy controls in this study[4].

The objective of this research is to examine the level of Vaspin in acne sufferers in comparison with regular control people and to link their levels with their severity.

2. Patients and methods

This study carried out on Dermatology, Venereology & Andrology Department at Benha University and include 6o patients. All patients sign a written informed consent.

The study approved by local ethics committee on research involving human subjects of Benha Faculty of Medicine.

2.1. Inclusion criteria
- Patients had not taken folate, vitamin B12 and B6, isotretinoin, doxycycline, or other drugs to treat acne for at least one month prior to the study.
- Diagnoses and assessments of acne severity performed according to the global acne grading system.
- Age > 18 years old.

2.2. Exclusion criteria
- Patients had serious infectious disease, history of hypertension, kidney or liver dysfunction, heart disease, and abnormal increase in transaminase or cancer; additionally, there were no patients or volunteers with drug addiction, febrile illness, diabetes, or neuroendocrine disorders.
- Age <18 years old.
- Pregnant and lactating women.

Thirty patients with moderate to severe acne enrolled in this study.Each patient subjected to full history taking, complete clinical examination, and

complete cutaneous examination to evaluate the clinical type and severity of acne according to the global acne grading system.

The subjects maintained a general diet and in a stable living condition at least one week before the study and avoid all participating in strenuous exercise or becoming fatigued within 24 hour of blood sampling. Subjects were required to have fasted for 12 hour before venous blood samples was taken. Blood samples, 3ml venous blood was withdrawn from each patient from the antecubetal fossa under complete aseptic conditions and were collected in disposable vacuum blood-collecting vessel tubes (red tubes) and CENTRIFUGED for testing. Serum VASPIN levels will estimated To perform the assays, micro-ELISA reactives for vaspin will be used.(Human Visceral adipose-specific serine protease inhibitor(vaspin) ELISA Kit)

2.3. Statistical Analysis

The collected data was revised, coded, tabulated using Statistical package for Social Science (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.). Data were presented and suitable analysis was done according to the type of data obtained for each parameter. Shapiro test was done to test the normality of data distribution. Descriptive statistics: Mean, Standard deviation ($\pm$ SD) for numerical data. Frequency and percentage of non-numerical data. Analytical statistics: Student T Test was used to assess the statistical significance of the difference between two study group means. Chi-Square test was used to

examine the relationship between two qualitative variables. Fisher's exact test: was used to examine the relationship between two qualitative variables when the expected count is less than 5 in more than 20% of cells. Correlation analysis: To assess the strength of association between two quantitative variables. The correlation coefficient defines the strength and direction of the linear relationship between two variables. The ROC Curve (receiver operating characteristic) provides a useful way to evaluate the sensitivity and specificity for quantitative diagnostic measures that categorize cases into one of two groups. The optimum cut off point was defined as that which maximized the AUC value. Regression analysis: Logistic and linear regression analyses were used for prediction of risk factors, using generalized linear models. N.B: p is significant if <0.05 at confidence interval 95%.

3. Results

The present study was conducted on 30 cases of AV. Their mean age was 27.6 years, they were 7 males (23.3%) and 23 females (76.7%). In addition to 31 healthy control group, their mean age was 26 years, they were 4 males (12.9%) and 27 females (87.1%). Cases and control groups had matched age and gender (p>0.05 for each). table 1

The Vaspin level in AV group was significantly higher when compared to control group (mean=2785.2 versus 155.4, p<o.oo1). table 2

Obesity was significantly associated with higher vaspin level when compared to non obesity in control (p<o.oo1), as well cases groups (p<o.oo1). table (3)

Table (1) Comparison of demographic data between cases and control groups.

		Control N=31		AV N=3o		p
Age (years)	mean±SD	26	±3	27.6	±4.9	0.134
Males	N, %	4	12.9%	7	23.3%	0.289
Females	N, %	27	87.1%	23	76.7%	

SD, standard deviation; age is compared using t test; gender is compared using chi square test.

Table (2) Comparison of Vaspin level between all studied groups.

	Control N=31		AV N=3o		p
	mean	±SD	mean	±SD	
Vaspin (ng/mL)	155.4	±41.7	2785.2	±885.9	**<o.oo1**

SD, standard deviation; student t test was used for vaspin comparison.

Table (3) Comparison of Vaspin level according to nutritional status of control and AV groups.

		Vaspin (ng/mL)					
		Control N=31			AV N=3o		
		mean	±	SD	mean	±	SD
Nutritional status	Non obese	135.4	±	32.5	9o5.7	±	3oo.9
	Obese	197.3	±	23.6	4o38.2	±	1332.1
	p	**<o.oo1**			**<o.oo1**		

SD, standard deviation; student t test was used for numerical parameters.

Levels of Vaspin increased gradually with increased severity grades. Regarding mild cases, mean Vaspin level was 215.4 ng/mL, regarding moderate cases, mean Vaspin level was 24o9.7 ng/mL, regarding severe cases, mean Vaspin was 4247.6 ng/mL, regarding very severe cases, mean Vaspin was 5o79 ng/mL. Higher Vaspin level was significantly associated with higher severity (p<o.oo1). table (4)

Logistic regression analysis was conducted for prediction of AV development using age, gender, BMI, CRP and Vaspin level as confounders. Higher BMI, CRP and Vaspin were associated with AV risk in univariable analysis. However, taking significant covariates into multivariate analysis revealed that only higher level of vaspin was suggested to be independent risk predictor for AV development. table 5

Regarding control group, vaspin level showed significant positive correlation with BMI. Regarding AV group, vaspin level showed significant positive correlation with BMI, CRP and GAGS; but not with age, or duration. table (6)

Receiver operating characteristic (ROC) curve of Vaspin level was conducted for discrimination between AV cases and control groups. Vaspin showed AUC of 0.989. At cut off value of 212.2, sensitivity was 96.7%, specificity was 96.8%, PPV was 96.7%, NPV was 96.7%, and accuracy was 96.8%. fig. (1)

ROC curve of Vaspin level was conducted for discrimination between mild to moderate versus severe to very severe AV cases. Vaspin showed AUC of o.93o. At cut off value of 3911.5, sensitivity was 9o%, specificity was 9o%, PPV was 81.8%, NPV was 94.7%, and accuracy was 9o%. fig. (2)

Table (4) Comparison of Vaspin level according to severity of AV group.

		Vaspin (ng/mL)			p
		mean	±	SD	
Severity	**Mild**	215.4	±	1o.o	**<o.oo1**
	Moderate	24o9.7	±	762.1	
	Severe	4247.6	±	192.6	
	Very severe	5o79.o	±	48.1	

SD, standard deviation; student t test was used for numerical parameters.

Table (5) Regression analysis for prediction of AV susceptibility.

	Univariable				Multivariable			
	p	OR	95% CI		p	OR	95% CI	
Age	0.131	1.063	0.982	1.151				
Gender	0.291	0.638	0.277	1.468				
BMI	0.025	1.116	1.014	1.229	0.649	1.065	0.812	1.396
CRP	0.007	1.742	1.164	2.608	0088	1.558	o.936	2.592
Vaspin	0.007	1.042	1.011	1.073	0.008	1.044	1.011	1.078

OR, odds ratio; CI, confidence interval. Logistic regression test was used.

Table (6) Correlations of Vaspin with age, BMI, CRP, duration and GAGS in control and AV groups.

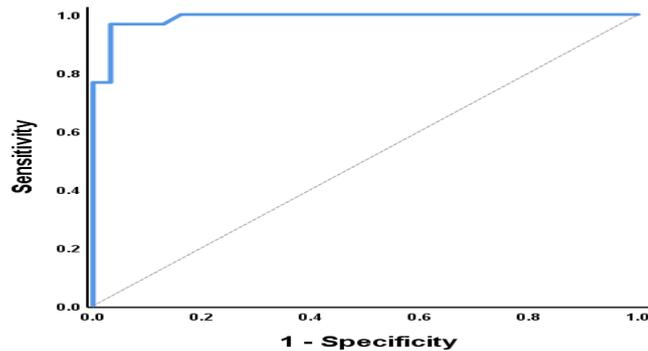|	Vaspin			
	Control N=31		AV N=3o	
	r	p	r	p
Age	-o.1o3	o.582	o.294	o.1o1
BMI	o.775	<o.oo1	o.871	<o.oo1
CRP	o.o26	o.89o	o.547	o.oo2
Duration	-	-	o.325	o.o79
GAGS	-	-	o.782	<o.oo1

r, Pearson's correlation coefficient

Fig. (1) ROC curve of Vaspin level for discrimination between cases and control groups.
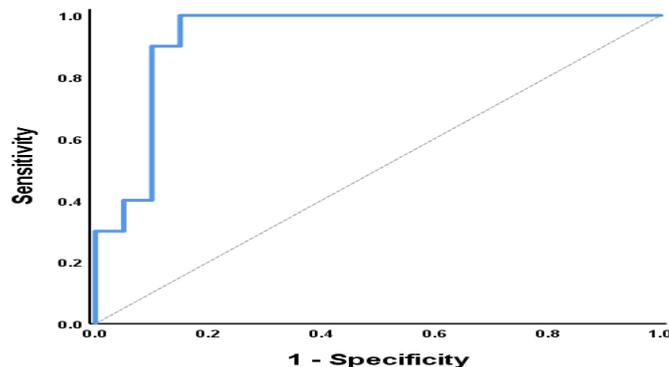

Fig. (2) ROC curve of Vaspin level for discrimination of AV severity.

4. Discussion

Vaspin is a new adipokine with anti-inflammatory effects. It has an anti-infammatory effect, a serine protease inhibitor of the serpin family. It plays a key part in the development of some infamous illnesses such as psoriasis. Vaspin has also been documented in its anti-inflammatory and anti-apoptotic abilities to prevent development of different obesity-related vascular complications [5].

Our research aims to assess the amount of Vaspin in the serum of acne sufferers in comparison with ordinary people and to connect its levels with the severity of the illness.

This research was carried out on 30 AV instances. Their age mean was 27.6 years, 7 men (23.3%) and 23 women (76.7 percent). They were 26 years old, four men (12.9 percent) and 27 women, in addition to 31 healthy control groups (87.1 percent). Cases and control groups were age and gender matched (each p>0.05).

In a similar research Alsulaimani et al.[6] performed a study evaluating a total of 54 individuals with acne. Most were females (44, 81.5%) and (10, 18.5%) were men. Of the participants, 49 (90.7 percent) were aged 18–24 years and 5 (9.3 percent) between 25–3 years.

In our research, we observed that the amount of Vaspin in the AV group was considerably greater than the control group (mean=2785.2 vs 155.4, p<0.001). Greater levels of vaspin were also linked with higher severity (p<0.001).

Vaspin also exhibited o.989 AUC. At a cut-off of 212.2, sensitivity was 96.7%, the specificity of 96.8%, 96.7%, NPV was 96.7% and the accuracy of 96.8%.

For prediction of AV severity a linear regression analysis utilising age, gender, BMI, CRP, duration and Vaspin levels as confounders has been performed. In a single study, greater BMI and Vaspin were linked with increased GAGS. While the multivariable analysis showed that only greater vaspin levels are an independent AV risk factor.

For prediction of AV development utilising age, gender, BMI, CRP and Vaspin as confusers, logistic regression analysis was performed. In univariable analysis, higher BMI, CRP and Vaspin were linked to the risk of AV. However, when relevant variables were included into multivariate analysis, only greater vaspin levels were indicated as independent risk predictors for the development of AV.

Different research have examined the connection between vaspine and inflammatory skin lesions such a psoriasis according to our results. Saalbach,[7], has shown the broad anti-inflammatory impact in vitro in Vaspin expressing keratinocytes on different kinds of immune cells implicated in psoriasis aetiology.

Coban et al [8] showed that patients with psoriasis had vaspin and resistin levels much greater than the control group.

In addition, Sayed, ET AL.[9] shows a significant difference between up-regulated vaspine levels of psoriasis before (99.72 pg/mg $\pm$ 12.39 pg/mg) and NB-

UVB (190.92 pg/mg ± 27.61 pg/mg) and vaspine with an essential function in psoriasis disease.

Heiker, [10], Heiker. Human vaspin (serpin A12) expression is linked to the index and sensitivity to insulin and enhances in vivo glucose tolerance.

El-Said et al. [11] observed that serum vaspin was substantially elevated in individuals with T2D.

The reasons for the discrepancy in our research with published studies may be because of the measuring differences between human vaspine systems ELISA and RIA. In the early morning fasting phase and a substantial postprandial reduction two hours after breakfast, Serum vaspin concentration showed a particular daily profile of the dietary intake with peak levels.

With respect to the connection between serum vaspin and other parameters in comparison with non-obesity in control (p<o.oo1), and cases (p<o.oo1), we observed that obesity is substantially related with a higher level.

According to Yang, et al.,[12], the vaspin concentration in a fat group is substantially greater than the ordinary weight group (498.2 ± 17.1 compared to 382.1 ± 21.3, P < 0.05). BMI was independent variable in all subjects affecting the serum vaspin concentration.

Furthermore, our findings indicate that the vaspin level exhibited a strong positive association with BMI for the control group.

In accordance with our findings, Saalbach et al, [7] showed that serum Vaspin levels in healthy people related (R = 0.527) with BMI.

In addition, the vaspin level exhibited substantial positive association with BMI, CRP, and GAGS.

Tan et al[13] showed that serum vaspin is substantially favourable about BMI, in line with our findings.

Yin, et al[14] found substantial positive associations between BMI and vaspin, hsCRP,

5. Conclusion

Vaspin levels were substantially greater in the AV group compared to the control group, with sensitivities of 96.7% and 96.8%. Obesity and AV severity were linked strongly with increased vaspin levels The vaspin level was linked strongly with the GAGS, BMI and CRP score. Level Vaspin has been proposed as an independent AV susceptibility and severity predictor.

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