Evaluation of Serum Chemerin Level in Patients with Acne Vulgaris

E.M.Sanad[1], S.E.Ibrahim[1], W.A.Abdul Haleem[2] and I.J.Hussein[1]

[1] Dermatology, Venereology and Andrology, Dept., Faculty of Medicine, Benha Univ., Benha, Egypt

[2]Clinical and Chemical Pathology., Dept., Faculty of Medicine, Benha Univ., Benha, Egypt

E-Mail:ibtsam@gmail.com

Abstract

Skin break out vulgaris is a constant cutaneous issue including brokenness of the pilosebaceous unit and is among the most well-known dermatological conditions around the world, with an expected 650 million individuals influenced. Serum chemerin is an adipokine that partakes in the resistant reaction by means of guideline of adipocyte improvement and metabolic capacity. Chemerin applies a critical impact on various resistant cell lines like NKs and DCs. In this way, serum chemerin was accounted for to apply a urgent job in a few provocative sicknesses. The investigation expected to assess serum level of Chemerin in patients with skin break out vulgaris. In addition, investigation of lipid profile boundaries and BMI was performed. The current examination included 50 skin inflammation vulgaris patients and 30 sound control subjects. Assessment of serum level of Chemerin in members and control bunches by protein connected immunosorbent measure (ELISA). Assessment of a lipid profile will be done in patients and control gatherings. Results and end: The base age in the skin inflammation bunch was 16 and the most extreme was 33, while the mean was 24.2 ± 5. The base age in the benchmark group was 17 and the greatest was 35, while the mean was 23.4 ± 4. Serum chemerin was fundamentally higher in skin break out patients contrasted with control subjects and was emphatically corresponded to seriousness of skin break out vulgaris. Assessment of serum lipid profile uncovered that skin inflammation patients had essentially serum cholesterol, TAG, LDL and fundamentally lower HDL contrasted with controls. In addition, skin inflammation patients had essentially higher BMI.

Keywords: Chemerin, Acne, Vulgaris.

1. Introduction

Skin inflammation vulgaris is an ongoing cutaneous issue including brokenness of the pilosebaceous unit and is among the most widely recognized dermatological conditions around the world, with an expected 650 million individuals influenced. The vast majority experience skin break out during youth and as numerous as half keep on experiencing skin break out in adulthood [1].

The customary worldview of skin inflammation has commonly comprised of four segments, frequently introduced in a consecutive style, where the overabundance in androgen or androgen action prompts expanded sebum creation, alongside follicular hyperkeratinization which brings about stopping of the follicle. This permits the bacterium Propionibacterium acnes to develop inside the follicle, ultimately finishing in a provocative course and clinically clear illness [2].

Metabolic disorder (MetS) is a condition involves a blend of interconnected physiological, biochemical, clinical, and metabolic variables that incline for atherosclerotic danger factors, including dyslipidemia, insulin obstruction, weight, and hypertension. Numerous pathophysiologic dysfunctions, like insulin obstruction (IR), that outcomes in metabolic adjustments can likewise bring about cutaneous sickness, for example, acanthosis nigricans, skin break out vulgaris, and alopecia [3]. Additionally, Studies has exhibited that sex chemicals are connected to pathways of MetS. which likewise assume a part in cutaneous illnesses [4].

Chemerin, otherwise called retinoic corrosive receptor responder protein 2 (RARRES2), tazarotene-incited quality 2 protein (TIG2), or RAR-responsive protein is a protein that is encoded by the RARRES2 quality. Chemerin is a chemoattractant protein that goes about as a ligand for the G protein-coupled receptor CMKLR1 (otherwise called ChemR23 "Chemokine receptor-like1 is a G protein-coupled receptor for the chemo-attractant adipokine chemerin and the omega-3 unsaturated fat eicosapentaenoic corrosive determined concentrated favorable to settling particle"). Chemerin is a 14 kDa protein emitted in an inert structure as prochemerin and is actuated through cleavage of the C-end by incendiary and coagulation serine proteases [5].

Chemerin was found to invigorate chemotaxis of dendritic cells and macrophages to the site of irritation. Chemerin has been embroiled in autocrine/paracrine motioning for adipocyte separation and furthermore incitement of lipolysis. Studies with 3T3-L1 cell line have shown chemerin articulation is low in predifferentiated adipocytes, yet its appearance and emission increment both during and after separation in vitro. Hereditary knockdown of chemerin or its receptor, CMKLR1 disables separation into adipocytes, and diminishes the statement of GLUT4 and adiponectin, while builds articulation of IL-6 and insulin receptor. Moreover, post-separation knockdown of chemerin lessens GLUT4, leptin, adiponectin, perilipin, and lipolysis, recommending that chemerin assumes a part in metabolic capacity of develop adipocytes. Studies utilizing developed human adipocytes, 3T3-L1 cells, and in vivo concentrates in mice showed that chemerin animates the phosphorylation of the MAPKs, ERK1, and ERK2, which are engaged with interceding lipolysis [6].

The point of this examination was to assess serum level of Chemerin in patients with skin inflammation vulgaris.

2. Patients and methods

This cross-section case control study was conducted on fifty patients suffering from acne vulgaris and thirty age and sex matched healthy volunteers served as controls. They were recruited from the outpatient clinic of Dermatology, Venereology and Andrology Department of

Benha University Hospitals, during the period from October 2019 to March 2020.

2.1. Inclusion criteria
- Patients with different clinical types and with moderate and severe Acne vulgaris.
- Age between 16 and 40 years old.
- Duration of the disease for more than 6 months.

2.2. Exclusion criteria
- Patients with history of infection, rheumatoid arthritis, other inflammatory and autoimmune diseases.
- Patients with malignant disorders.
- Pregnant and lactating females.
- Patients with systemic diseases.

The study was done after approval of ethics committee on research involving human subjects of Faculty of Medicine, Benha University

Every participant was subjected to: A complete history taken , Complete general examination including: Body mass index (BMI), waist circumference, systolic and diastolic blood pressure, Dermatological clinical examination will be done in all participants. Estimation of serum level of Chemerin in participants and control groups by enzyme linked immunosorbent assay (ELISA). Estimation of a lipid profile will be done in patients and control groups.

3. Statistical Analysis

The gathered information was changed, coded, arranged and acquainted with a PC utilizing Statistical bundle for Social Science (IBM Corp. Delivered 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp). Information was introduced and reasonable investigation was finished by the kind of information got for every boundary. Expressive insights:

Mean, Standard deviation (± SD), middle and reach for parametric mathematical information, Frequency and level of non-mathematical information. Scientific measurements: Independent T test: was utilized to survey the factual meaning of the contrast between two examination bunch implies. Relationship examination (utilizing Pearson's technique): To evaluate the strength of relationship between two quantitative factors. The connection coefficient indicated characterizes the strength and course of the direct connection between two factors. Chi-Square test was utilized to look at the connection between two subjective factors. P-esteem: level of importance: P≤ 0.05: Significant.

4. Results

This study included 50 acne patients (20 males and 30 females) and 30 control subjects (14 males and 16 females). The minimum age in the acne group was 16 and the maximum was 33, while the mean was 24.2 ± 5. The minimum age in the control group was 17 and the maximum was 35, while the mean was 23.4 ± 4. There was no significant difference between patients and control as regarded age and sex. Measurement of body mass index (BMI) revealed statistically significant higher BMI in acne group (mean = 27.1 ± 2.5) compared to control group (mean = 23.8 ± 1.9) Table (1).

Comparison of lipid profile levels between the two groups revealed statistically significant high levels of serum cholesterol, TAG and LDL in acne group compared to control subjects. On the hand, serum levels of HDL were significantly lower in acne patients compared to control subjects. Serum chemerin had statistically significant high levels in acne group compared to control subjects Table (2), fig. (1).

Table (1) Demographic data of the included subjects.

		Acne patients	Control group	P value
Gender	Male	20 (40%)	14 (47%)	0.559[a]
	Female	30 (60%)	16 (53%)	
Age (mean ± SD)		23.4 ± 4	24.2 ± 5	0.453[b]
BMI		27.1 ± 2.5	23.8 ± 1.9	**0.001***

[a] Using Chi-square test   [b] Using Independent t test   P value ≤ 0.05 is significant

Table (2) Comparison of lipid profile and serum chemerin levels between the two groups.

	Acne patients Mean ± SD	Control subjects Mean ± SD	Test value	p value
Serum cholesterol (mg/dl)	325 ± 102	159 ± 66	2.565	**0.019***
Serum TAG (mg/dl)	330 ± 104	128 ± 59	2.323	**0.025***
Serum HDL (mg/dl)	33 ± 10	42 ± 7	1.420	**0.040***
Serum LDL (mg/dl)	101 ± 14	82 ± 31	2.256	**0.028***
Serum Chemerin (ng/dl)	448 ± 190	296 ± 125	1.442	**0.045***

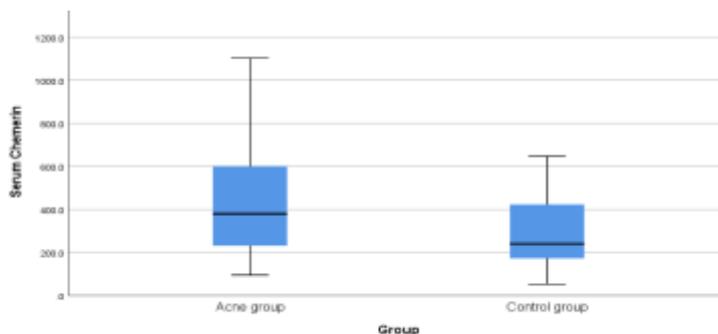Using Independent t test   P value ≤ 0.05 is significant

Fig. (1) Comparison of serum chemerin between the two groups.

No significant correlation was found on comparison of age and gender with levels of lipid profile and chemerin in acne patients Table (3).

On correlating patients' duration of acne and acne severity (GAGS score) with laboratory parameters, statistically significant positive correlation was found between serum levels of cholesterol, TAG, LDL and patients' GAGS score. On the other hand, there was significant negative correlation between serum HDL and GAGS score. No significant correlation was found between duration of acne and any of the laboratory parameters Table (4)

Correlation of serum chemerin with lipid profile parameters revealed statistically significant positive correlation between serum chemerin and serum levels of cholesterol, TAG and LDL. On the other hand, there was statistically significant negative correlation between serum chemerin and serum levels of HDL. Moreover, serum chemerin was positively correlated to BMI. Serum chemerin was positively correlated to severity of acne (GAGS score) Table (5).

Table (3) Correlation of demographic data with laboratory values.

		Cholesterol	TAG	HDL	LDL	Chemerin
Age	**r value**	-0.105	0.012	0.011	-0.093	0.308
	p value	0.616	0.955	0.957	0.659	0.153
Gender	**r value**	0.176	-0.152	0.143	-0.144	-0.169
	p value	0.400	0.468	0.494	0.492	0.441

Using Pearson Correlation test   P value ≤ 0.05 is significant

Table (4) Correlation of clinical characteristics with laboratory values.

		Cholesterol	TAG	HDL	LDL
Duration of acne	**r value**	-0.073	-0.107	-0.146	-0.074
	p value	0.728	0.611	0.488	0.726
GAGS	**r value**	**0.624**	**0.612**	**-0.426**	**0.495**
	p value	**0.001***	**0.002***	**0.034***	**0.018***

Using Spearman Correlation test   P value ≤ 0.05 is significant

Table (5) Correlation of serum chemerin with BMI, lipid profile parameters, duration of acne and GAGS score.

	Serum Chemerin	
	r value	**p value**
BMI	0.533	**0.011***
Cholesterol	0.491	**0.017***
TAG	0.656	**0.001***
HDL	-0.411	**0.031***
LDL	0.612	**0.002***
Duration of acne	0.135	0.540
GAGS score	0.715	**0.001***

Using Spearman Correlation test   P value ≤ 0.05 is significant

5. Discussion

The current examination expected to assess serum level of Chemerin in patients with skin inflammation vulgaris. It included 50 skin break out vulgaris patients and 30 solid control subjects. Each included subject was exposed to full history taking and clinical assessment, BMI, lipid profile and serum chemerin were additionally estimated.

Up as far as anyone is concerned, the current examination was the first to assess levels of serum chemerin in skin inflammation vulgaris patients. Serum chemerin was fundamentally higher in skin inflammation patients contrasted with control subjects. Additionally, serum chemerin was emphatically connected to seriousness of skin inflammation vulgaris (as indicated by GAGS score). Chemerin takes an interest during the time spent irritation through advancing chemotaxis of youthful dendritic cells (DCs) and macrophages. Also, serum chemerin levels associate with levels of the proinflammatory cytokines tumor corruption factor (TNF)-a, interleukin (IL)- 6 and C responsive protein (CRP) [7].

The current investigation showed that serum chemerin was likewise emphatically associated to serum cholesterol, TAG, LDL and BMI, while adversely related to serum HDL. These outcomes support the theory that serum chemerin had a likely job being developed and seriousness of skin inflammation vulgaris. Additionally, chemerin is connected with dyslipidemia and weight which contain the headliner in metabolic condition.

An examination that upheld this speculation was finished by Chyl-Surdacka et al., [8] who evaluated serum chemerin and lipid profile boundaries in patients with psoriasis and the sound benchmark group. This investigation uncovered higher centralization of chemerin was shown in the gathering of psoriasis patients contrasted with the benchmark group. Besides, there was positive relationship between's chemerin focus and weight file and fatty substance fixation. A reverse connection with HDL focuses was additionally noted. Altogether higher groupings of chemerin were seen in psoriatic patients with raised LDL levels in correlation with patients with typical LDL esteems.

In the current investigation, assessment of serum lipid profile uncovered that skin inflammation patients had fundamentally higher serum cholesterol, TAG, LDL and essentially lower HDL contrasted with control subjects.

Like our outcomes, Sobhan et al.,[9] contemplated lipid profile anomalies in 45 skin inflammation vulgaris patients and 45 solid controls. They referenced that fundamentally more elevated cholesterol level in skin break out patients. Other plasma lipids remembering TG and LDL for skin break out patients were higher contrasted with controls, yet without measurable importance.

In addition, serum cholesterol, TAG and LDL were emphatically connected to skin break out seriousness while HDL was adversely associated to skin break out seriousness. It was perceived that sebum lipid are gotten from once more union of sebaceous organ and blood lipid. Lipids flow in the blood inserted in particular complex particles structures generally incorporated in the liver,

known as lipoproteins [10]. The blood lipid and lipoprotein levels assume a part in deciding the structure of sebum lipid. The take-up of coursing lipid by sebaceous organs was 20% diminished of free unsaturated fats in sebum while in fat eating routine limitation. These outcomes showed that flowing lipid take-up was a significant stage in sebaceous lipids creation [11].

Utami et al., [12] considered the connection between's serum lipid profile and AV seriousness. They directed their examination on 62 skin inflammation vulgaris patients. There was a genuinely huge connection between's TC levels and AV seriousness just as a solid relationship between's LDL levels and AV seriousness. The investigation likewise tracked down an inclination of HDL levels decline, trailed by expanded AV seriousness. Utami et al., results were in understanding to results introduced in the current investigation.

Ekiz et al., [13] examined the situation with lipid levels in patients with postadolescent skin break out. Their investigation included 184 skin inflammation patients and 82 control subjects. Repudiating to our outcomes, they referenced that no critical contrasts were seen between patients with postadolescent skin break out and control subjects in fatty oil, all out cholesterol, and low-thickness lipoprotein cholesterol levels. In any case, HDL levels were essentially lower in skin break out patients contrasted with controls. A proposed clarification to this disparity is the diverse age bunch selected our examination (23.4 ± 4 for patients and 30.4 ± 5 for controls) contrasted with the referenced investigation (30.4 ± 4 for patients and 30± 4 for controls).

Expanded serum cholesterol levels may build the measure of sebum and keratinocyte expansion through androgen action. The skin break out inclined skin has higher androgen receptor thickness and 5 α-reductase movement than typical skin [10]. These previously mentioned results show the job of dyslipidemia in skin inflammation seriousness.

6. Conclusion

Serum chemerin revealed significant role in the pathogenesis of acne vulgaris. Serum chemerin was significantly higher in acne patients and positively correlated to severity of acne vulgaris. Lipid profile assessment revealed that dyslipidemia possessed a vital role in acne development. acne patients significantly had serum cholesterol, TAG, LDL and significantly lower HDL.

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