Identification of biochemical parameters in Iraqi girls suffered with Acne Vulgares

Mustafa M. Yunos, Haitham L. Al-Hayali, Owayes M. Hamed

 Mosul University \ Science Collage \ Biology Department

 Corresponding
 authors:

 mustafaaltaee9393@gmail.com
 & Owsbio31@uomosul.edu.iq

 haysbio68@uomosul.edu.iq

Abstract:

A number of biochemical variables associated with the incidence of acne in women in the study groups were estimated. Including a test that measures the level of the luteinizing hormone stimulating hormone, a test that measures the level of follicle stimulating hormone, a test that measures the level of milk hormone, a test that measures the level of testosterone, a test that measures the level of globulin associated with sex hormones. SHBG (6.20 \pm 9.65), FSH (3.201 \pm 9.05) and ZN (5.37 \pm 91.76) compared with control (7.19 \pm 12.01), (3.32 ± 8.69) and (6.29 ± 91.57) respectively. While there was a significant increase in the level of each of the TEST hormone (0.72 ± 0.93) and LH hormone (2.38 ± 9.17) compared with the control group (0.019 ± 0.044) and (0.94 ± 3.41) , respectively. The results of the study showed that within the age group 26-37 there was a decrease in the level of each of the hormone SHBG (5.40 \pm 9.52), FSH (3.35 \pm 8.36), and ZN (5.14 \pm 90.38) compared with the control group (4.60 \pm 26.54), (4.15 \pm 8.91) and (4.15 \pm 8.91). (3.86 \pm 94.16), respectively. While there was a significant increase in the level of each of the TEST hormone (0.67 \pm 1.30) and LH hormone (1.84 ± 8.24) compared with the control group (0.14 ± 0.13) and (0.84 ± 3.02) respectively. The results of the study showed that within the age group >37 there was a decrease in the levels of SHBG (5.99 ± 9.64), FSH (3.77 ± 8.47) and ZN (5.99 ± 91.35) compared with the control group (7.95 ± 18.25) , (0.84 ± 13.75) and (0.84 ± 13.75) 13.75). 4.88 ± 88.71), respectively. While there was a significant increase in the level of each of the TEST hormone (0.81 \pm 1.44) and LH hormone (1.10 \pm 6.83) compared with the control group (0.12 \pm 0.20) and (0.93 ± 3.52), respectively.

Keywords: Acne vulgares, biochemical parameters

Introduction:

The epidermis, dermis, and subcutaneous tissue are the three layers of skin that must be understood in order to comprehend the reasons of acne problems. Keratinocytes, mature epithelial cells, make up the majority of the epidermis. The capacity of keratinocytes to create hormones and respond via hormone receptors dispersed in the periphery is crucial to their function. The skin's appendages, such as sweat glands, sebaceous glands, nails, and hair, are found in the dermis. The sebaceous gland is the site of acne lesions. The sebaceous glands are made up of one or more lobules. (1) In maturity, acne frequently recurs; 26% of women and 12% of men still have acne in their forties. (2) Acne is the eighth most common illness worldwide, with the highest prevalence rates being seen in Western Europe, "high-income" North America, and southern Latin America. (3) A family history of severe acne, PCOS, the metabolic syndrome, and uncommon genetic diseases like Apert's syndrome are among the risk factors for developing acne. A primary inflammatory condition affecting the pilo sebaceous unit, acne. Cut bacterium acnes (formerly known as Propioni bacterium acnes), increased sebum production, hyper keratinization of the follicular infundibulum, inflammation, and these variables all play a role in the pathogenesis. Acne is highly heritable, with genetic variables accounting for 81% of population variation, according to studies involving twins. (4) The hormones and rogen and testosterone regulate sebum production. [5] Androgen hormone is what first starts the disease. [6] Patients with severe acne had higher amounts of dehydroepiandrosterone sulfate (DHEAS), but lower levels of the sex hormone-binding protein (SHBG), which further elevated the level of androgen. Both male and female patients may see significant elevations in their DHEAS, androstenedione, and SHBG levels. Consequently, sebum production contributes to the pathophysiology of acne by causing the inflammatory response. (7)

Genetics, hormonal variables, and bacteria are just a few of the causes of acne. It is well recognized that a person's sebaceous gland count is a hereditary feature and that it is unusual for one twin to experience more severe acne than the other twin. (8) The ICAM-1 gene, which is produced by endothelial cells during inflammation and promotes enhanced endothelium adherence to fixed white blood cells as well as leukocyte translocation at sites of inflammation, is one of the genes linked to the genetic influence on the emergence of acne. As a result, healing is inhibited when ICAM-1 protein activity is lost. Injury, keratinocyte migration from the margins of the injury to the center, and development of granulation tissue. (9)

The study's objective, is to detect the abnormality change biochemical parameters with acne vulgares in Irqi population.

Case Study:

From visits to dermatology offices and beauty salons in Mosul between September and December in the year 2022, 70 women of various ages—ranging from 18 to 45—were included in the research. Based on the disease's clinical cases, samples were collected. Based on the results of the biochemical testing, the samples were split into two groups.

The first group: This group included 20 women who did not suffer from acne and was considered as a control group.

The second group: This group included 50 women with acne based on biochemical tests

Collection of Blood sample:

Women's 5.0 ml venous blood was divided into two portions, with the first portion going into tubes containing the anticoagulant EDTA for DNA extraction, the second portion going into Eppendorf tubes containing trisol for RNA extraction, and the third portion going into container tubes. The blood was allowed to coagulate on an anticoagulant-free gel for 15 minutes before being centrifuged for 10 minutes at a speed of 3000 rpm to extract blood serum for use in different biochemical assays.

Biochemical test:

The number of biochemical variables, experience, and incidence of acne in women in the study groups were estimated Luteinizing Hormone (LH), Follicle-Stimulating Hormone (FSH), Prolactin hormone (PRL), Testosterone hormone (TEST), sex hormone binding globulin (SHBG) and zing (Zn). The level of PRL, TEST, FSH and LH hormones was measured by the AFIAS10 device equipped with the South Korean company Boditech, which works with immunofluorescence technology. The working principle of this assay depends on sandwich immune detection by binding the antibodies in the kit with the antigens present in the serum to form a complex of antibodies and antigens. There are many complexes of antibodies and antigens that lead to a strong signal by the antibodies of the detector, which are processed by AFIAS tests to show the concentration of PRL, TEST, FSH and LH hormones in the sample. The SHBG level, which is considered a physiological test, was measured based on ELISA technology, as several tests prepared by SUNLONG were used. The zinc level was measured by a spectrophotometer equipped by the German company EMC Its working principle depends on the interaction of zinc with the chromogen present in the sample.

Result and Discussion

Ages from 15 to 25

Verbal	Patient	Control
SHBG	9.65±6.20a	12.01±7.19a
TEST	0.93±0.72a	0.044±0.019b
FSH	9.05±3.201a	8.69±3.32a
LH	9.17±2.38a	3.41±0.94b
PRL	20.07±3.92a	18.12±0.76a
ZN	91.76±5.37a	91.57±6.29a

Ages from 26 to 35

Verbal	Patient	Control
SHBG	9.52±5.40b	26.54±4.60a
TEST	1.30±0.67a	0.13±0.14b
FSH	8.36±3.35a	8.91±4.15a
LH	8.24±1.84a	3.02±0.84b
PRL	30.52±25.94a	10.30±0.14a
ZN	90.38±5.14a	94.16±3.86a
Ages 37 and over		
Verbal	Patient	Control
SHBG	9.64±5.99b	18.25±7.95a
TEST	1.44±0.81a	0.20±0.12b
FSH	8.47±3.77b	13.75±0.84a
LH	6.83±1.10a	3.52±0.93b
PRL	62.39±38.13a	12.71±4.12b
ZN	91.35±5.99a	88.71±4.88a

Discussion

Facial acne is often a complication of androgen excess but however her SHBG level was very low and thus increased androgen activity which may negatively affect her complexion. Although PCOS often affects fertility, the most common manifestations of Adolescents include menstrual disorders related to ovarian dysfunction and skin complaints such as hirsutism and acne (10). Consideration of testosterone and SHBG levels is critical when evaluating hyper androgens. In adolescent girls with menstrual irregularities and acne, low plasma SHBG is often the only abnormal parameter in androgen tests. Low SHBG may be an early symptom of the syndrome. Polycystic ovaries and acne vulgaris, before the development of an overt phenotype(11). The results showed that there was a significant increase in the hormone TEST for women with acne, and the increase in testosterone in the blood may be attributed to androgens. The skin and sebaceous gland are able to produce and metabolize androgens as well as the adrenal hormone dehydroepiandrosterone (DHEAs), which circulate in the bloodstream at relatively high levels compared to other hormones. The main androgens that interact with the androgen receptor are testosterone and DHT. Androgen receptors are found in the basal layer of the sebaceous gland and the outer sheath of the keratinocytes of the hair follicle (12). A study showed a significant increase in the LH hormone, while a decrease in the FSH hormone compared to control samples. It may be associated with polycystic ovaries, which are found in many infected women when asked about acne, which leads to an increase in the LH hormone and a decrease in the FSH hormone. This change is possible. It is attributed to the disruption of the LH hormone, which is associated with a lower response to the progesterone hormone, which leads to a decrease in FSH and an increase in LH (13). It has been indicated that increased LH increases ovarian androgen secretion due to decreased levels of FSH bound to LH, and that androgens cannot be converted to estrogens by ovarian granulosa cells (14). With regard to the prolactin hormone, it was found to be elevated in women with acne. It is also known primarily for its role in milk production, with high levels during pregnancy and lactation. It is also known that it has more than 300 functions not related to lactation, and one of them may

play a role in causing the appearance of acne, however it was found through the study that prolactin increases the efficacy

(5 alpha-reductase). This enzyme is involved in steroid metabolism and is responsible for converting testosterone into DHT. The enzyme is produced in many tissues in both males and females, including the reproductive tract, testes, ovaries, skin, seminal vesicles, prostate, and epididymis (15). Significantly reduced serum zinc levels in acne vulgaris compared to acne-free controls. People who were treated with zinc had a significantly better acne response based on mean number of papules and clinical improvement. Future studies are needed to determine the optimal target for serum zinc level, duration and formulation of zinc therapy, and to evaluate the effectiveness of zinc therapy compared to other topical and systemic treatments for acne (16).

Conclusion: According to this study, the observation of different hormonal variables that affect acne

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