Lipid Profile Disturbance in Acne Vulgaris of Iraqi patients

[1]Ayat A. Hamood

*Pathological Analysis Department
Ministery of health – AL-Shatrah
General Hospital*

AL-Shatrah / Iraq
ayat.ab.h@sci.utq.edu.iq

[2]Hind M Mousa

*Pathological Analysis Department
Faculty of Science, University of Thi-
Qar, IRAQ*

Nasiriyah / Iraq
Hindmousa_pa@sci.utq.edu.iq

Abstract— **Acne vulgaris wide speared skin disease that cause psychological impact with increased risk of depression.This research on 90cases from male and female, 45 of acne patient and 45 of healthy controls. A blood samples was collected in addition to some information from all cases. Lipid profile was estimate. The results found that females patients more than males, and most of the acne patients resided in urban areas . Also, acne patients had significantly increased levels of cholesterol, triglycerides (TG), high-density lipoprotein (HDL) and low-density lipoprotein (VLDL) in their blood. On the other hand, a significant decrease in the level of low-density lipoprotein (LDL) . It had concluded that the difference in serum lipid levels between acne patients and healthy individuals, indicates that alteration of lipid profile is an significant factor in development acne in Iraqi patients .**

Keywords— Acne vulgaris , Lipid profile ,

I. Introduction

Acne vulgaris is a highly prevalent dermatologic disease of pilosebaceous follicles(Contassot, 2018; Lee *et al*., 2019).

Several factors leading to acne development including increase sebum production by the sebaceous gland under influence of different agents, follicular hyperkeratinization in the hair follicle, hyper colonization of bacteria *Propionibacterium acnes* (*P. acne*), and inflammatory mechanism that induce innate immunity and cause acne lesion (Feily *et al*., 2019) .

The sebum compounds are from blood lipid or sebaceous gland synthesis. The sebaceous gland is aggregated dietary fatty acids and cholesterol. The levels of serum lipoprotein and lipid may play a role in sebum composition. It is not clear to each extent can sebaceous gland take blood lipid or synthesizes sebum (Utami *et al*., 2019).

Hyperandrogenism , and polycystic ovarian syndrome PCOS positively correlate with adult acne, and Dyslipidemia is closely linked to this condition (Elsaie, 2016) .

The change in sebum composition as a result of altered lipid metabolism cause skin disruption and acne development (Kovács *et al.,* 2015) .Therefore, this study aimed to assess the disturbance of lipid profile levels in acne vulgaris patients and their comparison with the control to reveal its role in acne

II. Patients and Methods

A . Design of Study

The study comprised 45 acne patients of both genders who visited AL-shatrah General Hospital's Dermatology and Venereology Section between November 2020 to May, 2021. The age group was (16-45 years) .In addition, 45 healthy people with no acne served as a control group. Dermatologists confirmed the patient's clinical diagnosis.

B. Methods

All the collected subjects were fasting for 12-14 hours. Three millimeters from venous blood was collected in gel tube to separate serum. The blood was left for 15-30 min at room temperature and after that centrifuge the samples for 10-15 min for 5000 rpm. The resulting serum were used for estimate lipid profile levels by using especial kits from

companyBIO LABO for cholesterol, TG, HDL. On the other hand, LDL and VLDL were calculated parameter according to standard formula (Poyner and Cunliffe, 2002).

C. Statistical Aanalysis

By using SPSS program, statistical analysis was done. The results were shown as mean ± SD and P<0.05 was consider significant. T-test and chi-square were used.

III. RESULT

The present results showed no significant differences between patients and controls with regard to sex, as about 44.4% of the patient group were male and 55.6% were female. While 49% of the healthy group were males and 51% were females, with more prevalence to female However, acne it was more prevalent in females than in males. Table (1) .

Table(1): Distribution of acne patients and healthy According to Sex .

| Sex	Healthy		Patient		P. Value
	N	%	N	%	
Male	22	49%	20	44.4%	>0.05
Female	23	51%	25	55.6%	
Total	45	100%	45	100%	

As shown in Table (2), according to residential areas distribution indicated that 44.4% of acne patients lived in rural areas and 55.6% of acne patients lived in urban areas, while 31.1% of control lived in rural areas and 68.9% of

Residential areas	Healthy		Patients		P. Value
	N	%	N	%	
Rural	14	31.11%	20	44.44%	>0.05
Urban	31	68.89%	25	55.56%	
Total	45	100%	45	100%	

control group lived in urban areas. There was no significant difference (*p*>0.05) between patients and controls.

Table(2): Distribution of patients and control According to Residential Areas

The present study reported that patients were classified according to the duration of acne into three groups, 46.67% of patients in 1–5 years duration , Followed by 33.33% of patients in 6–10 years duration and only 20% of the patients in more than 10 years duration, as in Figure (1). These findings demonstrated a significant difference between the duration of acne groups.
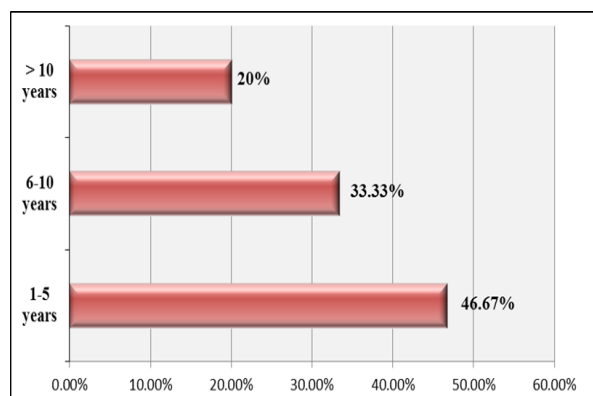
Figure(1): The Acne Groups According to Duration .

The study result listed in Table (3), appeared a high significant increase in the concentration of serum cholesterol, LDL, triglyceride, and VLDL in a patients with acne in comparison with the control group. Also, the same

Parameter in mg/dl	Groups	No. of cases	Mean ± SD	P. Value
Cholesterol	Patient	45	176.8±32.6	<0.05
	Control	45	123.22±26.34	
TG	Patient	45	90.36±27.14	<0.05
	Control	45	70.38±22.3	
HDL	Patient	45	42.38±5.95	<0.05
	Control	45	48.29±7.87	
LDL	Patient	45	116.35±24.85	<0.05
	Control	45	60.86±20.89	
VLDL	Patient	45	18.07±5.43	<0.05
	Control	45	14.08±4.46	

Table showed a quite significant decrease in serum HDL in acne patients comparison with controls (*P*<0.05).

Table (3) : Comparison of Sera Lipid Profile of acne Patients and Healthy Group

IV. DISCUSSION

The study result referred that distribution of acne according to sex was non-significant and male to female ratio was 1:1.25 and that agrees with researches byHalvorsen *et al.* (2009) and Sharquie *et al.* (2013).

Also, agree relatively with local study by Mousa (2010) in Thi-Qar , Muhammed and Dabbagh (2016), and Veena *et al.* (2020) . In this study found that female was more than male in patient group and this may be explain that the ratio of male to female varies due to different criteria used in the studies. Acne more wide speared for female patients throughout all years of life (Awan and Lu, 2017), this may be because change in hormones during the menstrual cycle, economic pressures, utilized cosmetic, and poor sleep quality (Albuquerque *et al.*, 2014). In addition, Females are more interesting in external appearance. Women perform most dermatology visits for acne (Uhlenhake *et al.*, 2010).

The non-significant difference between females and males in this study may be due to the small size of the samples and changes in social behavior, as well as the increase in the use of cosmetics by males in recent years, which in turn led to the exacerbation of male acne. It made them visit private and hospital dermatology clinics for medical advice, while the spread of unlicensed cosmetic clinics limited female visits to hospital and private dermatology clinics.

The study indicated that the majority of patients were living in an urban area, but it was non-significant risk factor. This result agree relatively with study by AL- Mosawi (2019) and Al Hussein *et al.* (2016) . This result may reflect the change in the rural lifestyle, and the improvement in their standard of living that eased them to come to the hospital and private dermatology clinic in the city .

But, the majority of patients in an urban area could be attributed to industrial effects in an urban area, as well as the purity of the climate in rural, which is free from dust and impurities (Rai*et al*., 2010). In addition, the food type at urban is depending on fast food (sausages, burgers, and pastries), a lot of sweet, and cake. This food was previous date as acne risk factor (Aksu*et al*., 2012) .

The mean duration of having acne was 5.9±4.4 years. This result agree with research by Borgia *et al.* (2004)and relatively with Egyptian data that found the mean duration of having acne was 5.8±5.17 years (Awad *et al.*, 2018). This could be due to disorders as hormonal changes or insufficiency cleaning of the skin to eliminate microorganisms, as seen in adolescent lack hygiene (Qidwai *et al.*, 2017).

Data by Abulnaja (2009) on obese adolescent females with acne in Saudi Arabia agree with some our result, estimated TG, HDL, and LDL only.

Jiang *et al.* (2015) study indicated a significant increase in serum cholesterol, TG, and LDL in patients. Also, in same study the ratio of LDL/HDL in male patients with severe acne was significantly higher than the control group. In addition, Rather *et al* (2016) demonstrated significant differences in cholesterol, TG, and VLDL, when comparing patients with controls, but the high level of LDL and low level of HDL were non-significant. However, study by Veena*et al.* (2020) found rise in lipid profile in acne patients but it was non-significant.

It is difficult to explain, but the difference result of studies could be because of the change on serum lipid levels by racial, dietary habits, environmental, genetic factors, and smoking (El-Akawi *et al.*, 2007).

The cholesterol effect on acne by it is role in synthesized of androgen hormone, Cholesterol is consider the precursor of androgen hormones(Shrestha, 2018).

The high significant level of serum triglyceride may due to that triglyceride levels were rised in patients when consumption of fat rich food (Barson *et al.*, 2012).Acne patients were high intake of sweets, dietary fat, carbonated drinks, and white bread and little fish and fruitcompared to controls (Al Hussein *et al.*, 2016).

The VLDL was calculated from triglyceride, so it was affected with elevated triglyceride levels. On the other hand, LDL was a calculated parameter, increased cholesterol level

and decreased HDL leads to increase in LDL. These increase or change lipid composition lead to hyperkeratinization and chronic inflammation, which further induce microbial hyper colonization. The Sebaceous glands may act as a link between lipid metabolism and inflammation similar to adipocytes (Lovászi *et al.*, 2017)

V. CONCLUSION

According to the results of the current data, acne patients showed an elevated sera levels of lipid profile compared to the control group, hence it was concluded that disturbances in lipid profile levels play a vital role in acne pathogenesis and can be considered as a warning sign in the treatment of acne.

VI. ACKNOWLEDGMENT

VII. ETHICAL CONSIDERATION

The ethical permission was obtained from the AL-shatrah hospital and from all participants in this work (patients and healthy) to conduct the research .

VIII. CONFLICT OF INTEREST

The authors declare no conflicts of interest

IX. REFERENCES

Abulnaja, K. O. (2009). Changes in the hormone and lipid profile of obese adolescent Saudi females with acne vulgaris. Brazilian Journal of Medical and Biological Research, 42(6), 501–505.

Aksu, A. E. Metintas, S., Saracoglu, Z. N., Gurel, G,. Sabuncu, I., Arikan, I., and Kalyoncu, C. (2012). Acne: prevalence and relationship with dietary habits in Eskisehir, Turkey. Journal European Academy of Dermatology Venereology, 26(12), 1503–9.

Al Hussein, S. M., Al Hussein, H., Vari, C. E., Todoran, N., Al Hussein, H., Ciurba, A., & Dogaru, M. T. (2016). Diet, Smoking and Family History as Potential Risk Factors in Acne Vulgaris – a Community-Based Study. Acta Medica Marisiensis, 62(2), 173–181.

Albuquerque, R. G. R., Rocha, M. A. D., Bagatin, E., Tufik, S., & Andersen, M. L. (2014). Could adult female acne be associated with modern life? Archives of Dermatological Research, 306(8), 683–688.

AL-Mosawi, A. S. (2019). Immunophysiological study of Acne in different age groups in Thi-Qar province. (Master thesis, University of Thi-Qar).

Awad, S. M., Morsy, H., Sayed, A. A., Mohamed, N. A., Ezzat, G. M., & Noaman, M. M. (2018). Oxidative stress and psychiatric morbidity in patients with facial acne. Journal of Cosmetic Dermatology, 17(2), 203–208.

Awan, S. Z., & Lu, J. (2017). Management of severe acne during pregnancy: A case report and review of the literature. International Journal of Women's Dermatology, 3(3), 145–150.

Barson, J. R., Karatayev, O., Gaysinskaya, V., Chang, G. Q., & Leibowitz, S. F. (2012). Effect of dietary fatty acid composition on food intake, triglycerides, and hypothalamic peptides. Regulatory Peptides, 173(1–3), 13–20.

Borgia, F., Cannavò, S., Guarneri, F., Cannavò, S. P., Vaccaro, M., & Guarneri, B. (2004). Correlation between endocrinological parameters and acne severity in adult women. Acta Dermato-Venereologica, 84(3), 201–204.

Contassot, E. (2018). Vaccinating against Acne: Benefits and Potential Pitfalls. Journal of Investigative Dermatology, 138(11), 2304–2306.

El-Akawi, Z., Abdel-Latif, N., Abdul-Razzak, K., & Al-Aboosi, M. (2007). The relationship between blood lipids profile and acne. Journal of Health Science, 53(5), 596–599.

Elsaie, M. L. (2016). Hormonal treatment of acne vulgaris: An update. Clinical, Cosmetic and Investigational Dermatology, 9, 241–248.

Feily, A., Taheri, T., Meier-Schiesser, B., Rhinehart, D. P., Sobhanian, S., Colon-Diaz, M., Feily, A., & Ramirez-Fort, M. K. (2019). The effect of low-dose isotretinoin therapy on serum androgen levels in women with acne vulgaris. International Journal of Women's Dermatology, 6(2), 102–104.

Halvorsen, J. A., Dalgard, F., Thoresen, M., Bjertness, E., & Lien, L. (2009). Is the association between acne and mental distress influenced by diet? Results from a cross-sectional population study among 3775 late adolescents in Oslo, Norway. BMC Public Health, 9, 1–8.

Hanisah, A., Omar, K., & Shah, S. A. (2009). Prevalence of acne and its impact on the quality of life in school-aged adolescents in Malaysia. Journal of Primary Health Care, 1(1), 20–25.

Jiang, H., Li, C. Y., Zhou, L., Lu, B., Lin, Y., Huang, X., Wei, B., Wang, Q., Wang, L., & Lu, J. (2015). Acne patients frequently associated with abnormal plasma lipid profile. Journal of Dermatology, 42(3), 296–299.

Kovács, D., Lovászi, M., Póliska, S., Oláh, A., Bíró, T., Veres, I., Zouboulis, C. C., Ståhle, M., Rühl, R., Remenyik, É., and Törőcsik, D. (2015). Sebocytes differentially express and secrete adipokines 1. Experimental Dermatology, 25(3), 194–199.

Lee, Y. B., Byun, E. J., & Kim, H. S. (2019). Potential Role of the Microbiome in Acne: A Comprehensive Review. Journal of Clinical Medicine, 8(7), 987.

Lovászi, M., Szegedi, A., Zouboulis, C. C., & Törőcsik, D. (2017). Sebaceous-immunobiology is orchestrated by sebum lipids. Dermato-Endocrinology, 9(1), e1375636.

Mousa, H. M. (2010). Isolate and diagnose the bacteria associated with acne injuries and study the effect of some of the factors associated with the appearance of acne to a sample of students of the Faculty of Education at the University of Dhi Qar. Journal of the College of Education, 1(1), 159–168.

Muhammed, N., & Dabbagh, R. (2016). Isolation and identification of microorganisms in acne patients. Zanco Journal of Medical Sciences, 20(2), 1330–1336.

Poyner, T., and Cunliffe, B. (2002). Commentary: A UK primary care perspective on treating acne. British Medical Journal: International Edition, 325(7362), 478-479.

Qidwai, A., Pandey, M., Pathak, S., Kumar, R., & Dikshit, A. (2017). The emerging principles for acne biogenesis: A dermatological problem of puberty. Human Microbiome Journal, 4, 7–13.

Rai, P., Mallidi, S., Zheng, X., Rahmanzadeh, R., Mir, Y., Elrington, S., Khurshid, A., and Hasan, T. (2010). Development and applications of photo-triggered theranostic agents. Advanced Drug Delivery Reviews, 62(11), 1094–1124.

Rather, S., Shahab-Ud-Din, S., Sameen, F., Aleem, S., & Jeelani, S. (2016). The Relationship between Blood Lipid Profile and Acne in Non-obese, Non-PCOS Patients. International Journal of Contemporary Medical Research, 3(4), 2454–7379. www.ijcmr.com

Sharquie, K. E., Noaimi, A. A., & Al-Janabi, E. A. (2013). Treatment of Active Acne Vulgaris by Chemical Peeling Using TCA 35%. Journal of Cosmetics, Dermatological Sciences and Applications, 03(03), 32–35.

Shrestha, S. (2018). Correlation of Hormonal Profile and Lipid Levels with Female Adult Acne in a Tertiary Care Center of Nepal. Journal of Nepal Health Research Council, 16(2), 222–227.

Uhlenhake, E., Yentzer, B. A., & Feldman, S. R. (2010). Acne vulgaris and depression: A retrospective examination. Journal of Cosmetic Dermatology, 9(1), 59–63.

Utami, O. C., Kurniawati, Y., Diba, S., & Saleh, M. I. (2019). Correlation between serum lipid profile and acne vulgaris severity. Journal of Physics: Conference Series, 1246(1).

Veena, H., Narayanaswamy, Shilpa, K., Leelavathy, B., and Lakshmi, D. V. (2020). Comparative analysis of serum lipid profile in adults with and without acne vulgaris in a tertiary care center in South India. Clinical Dermatology Review, 4(2), 160.