Correlation between Lipid Profile and Acne Vulgaris

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General Note

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ABSTRACT

Objective: assessment of lipid profile in acne patients and its relationship with acne occurrence and severity. *Methods:* A case-control study carried out in a private outpatient clinic during the period from March 2018 to June 2019, in the department of dermatology, Basrah, Iraq. *Results:* The study included 124 subjects divided into two groups, 62 patients with acne and 62 healthy matched control (there was no significant difference between control and acne groups in their age and gender). Serum TC and LDL was significantly higher in acne patients, while both HDL and TG did not differ significantly between both groups. Mean HDL was significantly higher in acne female patients compared to female control, while the rest of the variables did not show significant difference. There were no significant differences between various lipid parameters according to increased severity of acne. *Conclusions:* The current work highlights some important lipid abnormalities in acne patients which involved HDL mostly, while no association with acne severity was noted in the present work.

Keywords: Minocycline, Acne, Therapy

discovery

1. INTRODUCTION

Acne vulgaris considered the most prevalent disease that have significant effect on adolescents globally, acne vulgaris is most frequent among adolescents and young adults but is not limited to these ages (Wolkenstein *et al.*, 2018; AlSohaimi, 2020). The preadolescent represent the most important period in which acne appeared, which late disappear in the third decade, but may persist into adulthood or develop de novo in adulthood (Goulden *et al.*, 1997). The prevalence of acne decreases with increasing age (Collier *et al.*, 2008a).

Acne vulgaris is an inflammatory disease that affect the follicles of the fair and sebaceous gland, this disease involved multiple etiological causes ranging from host, hormonal, infections, immune system overactivation, genetic and dietary causes (O'Neill and Gallo, 2018).

Increased body of evidence suggest that alteration in lipid profile is associated with acne in terms of occurrence or severity, we performed this study (which is the first to our knowledge in Iraq) to assess such relationship.

2. PATIENTS AND METHODS

Study design and setting

A case-control study carried out in a private outpatient clinic during the period from March 2018 to June 2019, in the department of dermatology, Basrah, Iraq.

The study included 62 participants who had untreated acne transfer from the department of dermatology, in Alsadr teaching hospital. The patients were divided to four groups in accordance with acne severity by Global Acne Grading System (GAGS) (Doshi *et al.*, 1997). The four groups are based on the severity of disease: none = 0, mild = 1 − 18, moderate = 19 − 30, severe ≥31 (Doshi *et al.*, 1997).

Inclusion criteria

Untreated acne, and age equal to or above 12 years (patients aged below 18 years a parent or legal guardian provided written informed consent).

Exclusion criteria

Refuse to enter the study, pregnancy or lactating women, use of contraceptive methods, use of drugs that have effect on blood lipid, use of isotretinoin, and diseases that affect lipid metabolism.

Participants

After obtaining written informed permission from the patient, full history was taken related to(age, sex, and severity of the disease).

Laboratory analysis

Venous blood sample obtained from both cases and control, to measure serum level of cholesterol (TC), triglyceride (TG), low-density lipoprotein (LDL), and high-density lipoprotein (HDL). The measurement of serum levels was based on enzyme linked (ELISA), except for LDL which was estimated using Friedewald's formula:

$$LDL \left(\frac{mg}{dL}\right) = TC \left(\frac{mg}{dL}\right) - HDL \left(\frac{mg}{dL}\right) - \frac{TG \left(\frac{mg}{dL}\right)}{5}$$

Statistical analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS, version 22). One way ANOVA or independent t-test used to assess the differences in means in three of two groups respectively. The level of significance was ≤ 0.05.

3. RESULTS

The study included 124 subjects divided into two groups, 62 patients with acne and 62 healthy matched control (there was no significant difference between control and acne groups in their age and gender). Serum TC and LDL was significantly higher in acne patients, while both HDL and TG did not differ significantly between both groups, as illustrated in table 1.

Table 1: Assessment of demographic and lipid parameters according to study group

Variables	Control	Acne	p-value
Number	62	62	-
Age, (years)	24.9 ± 6.1	26.8 ± 6.8	0.101
Female, n (%)	43 (69.4%)	40 (64.5%)	0.567
TC (mg/dL)	130.5 ± 18.2	137.7 ± 19.9	0.040
LDL (mg/dL)	73.6 ± 17.5	77.5 ± 16.5	0.211
HDL (mg/dL)	37.9 ± 7.8	41.5 ± 7.6	0.010
TG (mg/dL)	95.4 ± 34.5	93.7 ± 37.3	0.797

Mean HDL was significantly higher in acne female patients compared to female control, while the rest of the variables did not show significant difference as illustrated in table 2.

Table 2: Assessment of lipid parameters according to gender

Variables	Female			Male		
	Control	Acne	p-value	Control	Acne	p-value
Number	43	40	-	19	22	-
TC (mg/dL)	130.5 ± 19.4	137.8 ± 20.9	0.100	130.7 ± 15.7	137.4 ± 18.3	0.225
LDL (mg/dL)	75.8 ± 17.9	78.7 ± 16.5	0.456	68.6 ± 15.8	75.2 ± 16.5	0.198
HDL (mg/dL)	36.3 ± 7.3	40.3 ± 7.8	0.017	41.5 ± 7.8	43.6 ± 6.8	0.360
TG (mg/dL)	91.9 ± 34.4	94.3 ± 39.7	0.770	103.2 ± 34.1	92.6 ± 33.5	0.324

Younger participants (<25 years) with acne had significantly higher TC levels compared normal control, the rest of the variables did not show significant difference between both groups, as illustrated in table 3.

Table 3: Assessment of lipid parameters according to age

Variables	<25 years			≥25 years		
	Control	Acne	p-value	Control	Acne	p-value
Number	28	25	-	28	25	-
TC (mg/dL)	130.0 ± 18.4	140.9 ± 18.7	0.037	131.0 ± 18.3	135.5 ± 20.7	0.344
LDL (mg/dL)	73.4 ± 19.1	80.0 ± 14.5	0.167	73.8 ± 16.3	75.8 ± 17.6	0.634
HDL (mg/dL)	37.9 ± 7.7	42.1 ± 8.1	0.059	37.8 ± 8.0	41.0 ± 7.3	0.080
TG (mg/dL)	93.3 ± 33.6	94.1 ± 37.8	0.930	97.1 ± 35.5	93.4 ± 37.6	0.673

There were no significant differences between various lipid parameters according to increased severity of acne, as illustrated in table 4.

Table 4: Assessment of lipid parameters according to the severity of acne

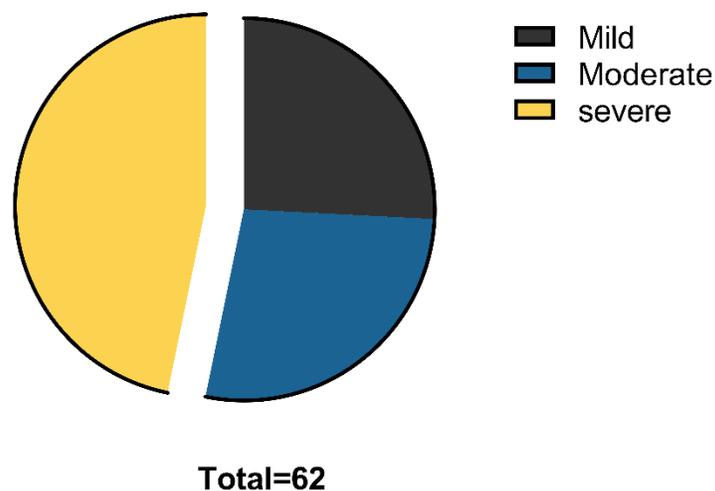| Variables	Acne severity			p-value
	Mild	Moderate	severe	
Number	16	17	29	-
TC (mg/dL)	140.3±19.2	136.7±19.5	136.8±21.0	0.838
LDL (mg/dL)	83.4±15.4	75.0±19.4	75.6±14.8	0.245
HDL (mg/dL)	40.5±7.2	41.7±7.0	41.9±8.3	0.842
TG (mg/dL)	81.7±32.6	99.8±41.7	96.7±36.8	0.321

Total=62

Figure 1: distribution of acne patients according to the severity

4. DISCUSSION

In the present study female showed higher rates for having acne compared to males (64.5% is female), which is consistence with several other studies (Collier *et al.*, 2008b, Dréno, 2015, El-Hamd *et al.*, 2017), while in other (Li *et al.*, 2017) males showed higher prevalence than females. These variations could be attributed to differences in skin care, life-style, and genetic variation that affect androgen levels (Li *et al.*, 2017). Few other studies found no difference in the distribution of females and males (Karciauskiene *et al.*, 2014, Sharma *et al.*, 2017).

In the current work in both female and male; serum cholesterol and LDL were higher in acne patients compared to control, however it did not reach statistical significance level (p-value >0.5), while HDL was significantly higher in acne patients compared to control in females but it did not show significance difference in males. These findings were in agreement with another study (El-Akawi *et al.*, 2007) in which only HDL showed significant level, while both cholesterol and LDL did not significance levels. While in another study (Sobhan *et al.*, 2020) HDL was not significantly different in contrary to our findings, while cholesterol was significantly higher in acne patients compared to control in both gender (Sobhan *et al.*, 2020). While in a Chinese study they authors reported no significant differences in lipid profile between acne and control group (Jiang *et al.*, 2015).

In term of severity of acne, no association between increased level of acne severity with elevated levels of various lipid profile, which was in agreement with other studies (Sobhan *et al.*, 2020), while in some studies change in triglyceride, HDL and LDL in both females and males (El-Akawi *et al.*, 2007, Jiang *et al.*, 2015).

5. CONCLUSION

The current work highlights some important lipid abnormalities in acne patients which involved HDL mostly, while no association with acne severity was noted in the present work.

Author contribution

Firas Fakhir Altameemi: Conception and design of the work, the acquisition, analysis, and interpretation of data for the work, and Drafting the work.

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Conflict of Interest

The authors declare that they have no conflict of interest.

Informed consent

Written informed consent was obtained from all individual participants included in the study. Additional informed consent was obtained from all individual participants for whom identifying information is included in this manuscript.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards (Code: 2019/C084).

Data and materials availability

All data associated with this study are available upon request to the corresponding author.

Peer-review

External peer-review was done through double-blind method.

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