Original Article

www.wjahr.com

EVALUATION OF SERUM LIPIDS LEVELS IN MALE PATIENTS WITH ANDROGENETIC ALOPECIA

Lubana Alkhayer*, Jamal Khaddam** and Faisal Radwan***

*M.D. Department of Dermatology and Venereology, Faculty of Medicine, Tishreen University Hospital, Lattakia, Syria.
**Prof., Department of Dermatology and Venereology, Faculty of Medicine, Tishreen University Hospital, Lattakia, Syria.
***Prof., Department of Laboraory, Faculty of Medicine, Tishreen University Hospital, Lattakia, Syria.

*Corresponding Author: Dr. Lubana Alkhayer

M.D. Department of Dermatology and Venereology, Faculty of Medicine, Tishreen University Hospital, Lattakia, Syria.

ABSTRACT

Background: Androgenetic alopecia (AGA) is an androgen-dependent, hereditary trait resulting from the conversion of scalp terminal hairs into miniaturized vellus hairs in a characteristic pattern. The frequency and severity increase with age, and at least 80% of Caucasion men show evidence of AGA by age 70 years.[1] **Objective:** This study was designed to find out the association between dyslipidemia and androgenetic alopecia. **Methods:** This study was a case - control study conducted at Tishreen University Hospital, Lattakia, during the period between Jan 2022 and Jan 2023. 60 Patients diagnosed as having androgenetic alopecia and 50 age and sex matched controls without AGA were studied after taking their consent. Detailed history and clinical examination were performed, laboratory values of serum lipids levels and androgenetic alopecia and Hamilton Norwood scale were assessed to define the degree of AGA. **Results:** Patients with AGA had higher CHOL, TG, LDL levels and lower HDL levels than controls (P<0.05), and higher prevalence of dyslipidemia with the duration of AGA and the degree of AGA (P<0.05). There was no association between age, or BMI and dyslipidemia in the case study. **Conclusion:** there was a related association between dyslipidemia and AGA. Dyslipidemia in patients with AGA is positively associated with duration and degree of the disease.

KEYWORDS: *androgenetic alopecia, dyslipidemia.*

INTRODUCTION

Several studies have proven a relationship between androgenetic alopecia and the risk factors of the cardiovascular disease, especially dyslipidemia. A positive directing relationship between the degree of androgenetic alopecia and the severity of dyslipidemia is also observed.[2,3]

The relationship between androgenetic alopecia and the dyslipidemia remains not explained clearly. Several theories have been proposed to interpret it, including the theory of high sensitivity to androgens where there are androgens receptors and 5-Alpha Reductase in the blood vessels, fatty tissues and hair follicles, and therefore the hypersensitivity to androgens leads to accompanying androgenetic alopecia with dyslipidemia.

Another theory is the state of the chronic inflammation that occurs around the hair follicles in the (AGA) patients, where inflammatory cytokines reduce the transmission of cholesterol and cause disorder in the lipos proteins. Also, the peripheral inflammatory cursing in AGA patients may be a reflection of systemic inflammation, which leads to metabolic syndrome.[4]

PATIENTS AND METHODS

This study included 60 male patients with AGA, from all ages, from outpatient dermatology clinic, Tishreen University Hospital and enrolled in the study from January 2022 to January 2023. Fifty agematched healthy men with a normal hair status were also recruited. An informed written consent was taken from each individual in the case and control groups. Men who were on any medication which could affect lipid metabolism, smokers, alcohol drinkers and those with Diabetes Mellitus (DM), CAD, hypertension (HTN), familial

hyperlipidemia, thyroid disease, chronic renal failure, liver disease, and all of secondary reasons which cause dyslipidemia were excluded from both groups. The baldness pattern was assessed by Hamilton Norwood Scale, which is the most popular scale to definition the degree of the AGA.[6] [7]

After 12-14 hours of fasting, a venous blood sample was taken for lipid profile including cholesterol, triglyceride (TG), high density lipoprotein (HDL), low density lipoprotein (LDL).

Data was analyzed using Independent T student, Pearson Correlation, and Chi square. A P-value less than 0.05 was accepted as evidence of statistical significance.

RESULTS

This study included 60 male patients with AGA and 50 males with a normal hair status. The mean age of the cases and controls was 39.28 ± 13.1 years. There was no statistically significant difference between patient and control groups regarding age.

According to the Hamilton-Norwood classification, 20 patients of the case patients (33,3%) were in stage 3, 17 patients (28.3%) in stage 4, 10 patients (16.7%) in stage 1, 8 patients (13.3%) in stage 5, 3 patients (5%) in stage 6 and 2 patients (3.3%) in stage 7. (Fig 1)

The average BMI of the patients group was (23.94). The average BMI of the control group is (22.66). There is no statistical difference between the two groups in terms of BMI (p>0.05).

The percentage of (71.7%) of the research sample had a duration of AGA for more than 10 years, while the percentage of (28.3%) had a duration of AGA less than 10 years. (Fig 2)

The mean of serum cholesterol in the patients group was 173.69 and in the control group was 153.85. The mean of serum TG values in the patients group was 152.91 and in the control group was 115.4. The mean of serum LDL in the patients group was 108.52 and in the case group was 90.29. The average of serum HDL values in the patients group was 46.1 and in the control group was 48.99. There was a significant difference between serum Cholesterol, TG, LDL and HDL values between both groups (p<0.05) (Table 1).

The study also observed that the dyslipidemia were statistically significantly more higher in patients with severe AGA as compared to patients with mild-moderate AGA (Table 2).

This study also observed (through pearson correlation) that there is a positive correlation between the duration of AGA and the severity of dyslipidemia (Table 3).

DISCUSSION

Our study included 110 male patients, the patients were distributed as follows: 60 patients with androgenetic alopecia and 50 patients as a control sample.

The age of the research sample patients ranged from 18 to 70 years, with an average of 39.28 ± 13.1 years.

The duration of androgenetic alopecia in the research sample ranged from 4 to 30 years, with an average of 12.54 ± 5.9 years.

The samples of alopecia patients were distributed according to the severity of the disease and according to Hamilton-Norwood scale into seven grades, the grades 3 and 4 were the most frequent at 33.3% and 28.3%, respectively.

Comparison of age and body mass index (BMI) between the two study groups:
We did not notice any statistically significant differences, meaning that any differences in the values of the required laboratory analyzes are not due to the age difference or the BMI value between the group of patients and controls.

Comparison of blood lipid levels between the two study groups:
The levels of cholesterol, triglycerides, and low-density lipoprotein were higher in the group of androgenetic alopecia patients compared to the control group, with a statistically significant difference between the two groups and a (P-value) < 0.05.

HDL levels were slightly lower in the AGA patients group with a statistically significant difference between the two groups (p-value < 0.05). These results can be explained by the role of inflammatory cytokines involved in the pathogenesis of androgenetic alopecia, which is responsible for disturbing blood lipid levels, as mentioned above.[2]

Comparison of blood lipid levels in a group of patients according to the duration of androgenetic alopecia:
Using the Pearson Correlation, we noticed a positive correlation (direct proportionality) between the duration of AGA and the levels of total cholesterol, triglycerides, and low-density lipoprotein with statistically significant differences, and a statistically significant inverse correlation with high-density lipoprotein, because with Increasing the duration of AGA, inflammatory cytokines accumulate, their quantity becomes greater, and they have a higher ability to cause disturbances in blood lipid levels.[2]

Comparison of blood lipid levels in a group of patients according to the severity of androgenetic alopecia:
By studying the relationship between the degree of alopecia and the disorder of blood lipid levels using Chi-square, it was found that there is a statistically significant

relationship between the degree of alopecia and the disorder of each level of blood lipid levels, as with the increase in the degree, the disorder of all lipid levels increases, according to the scale of the severity of androgenic alopecia HAMILTON – NORWOOD.
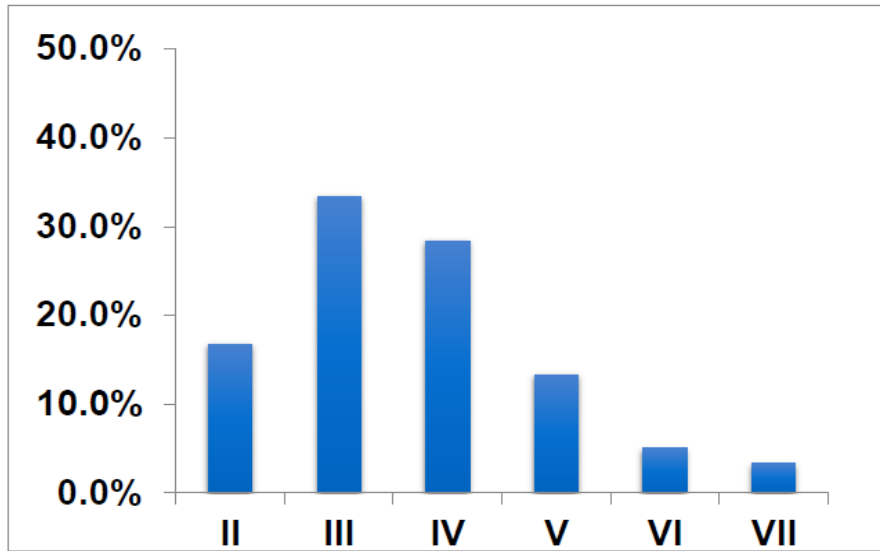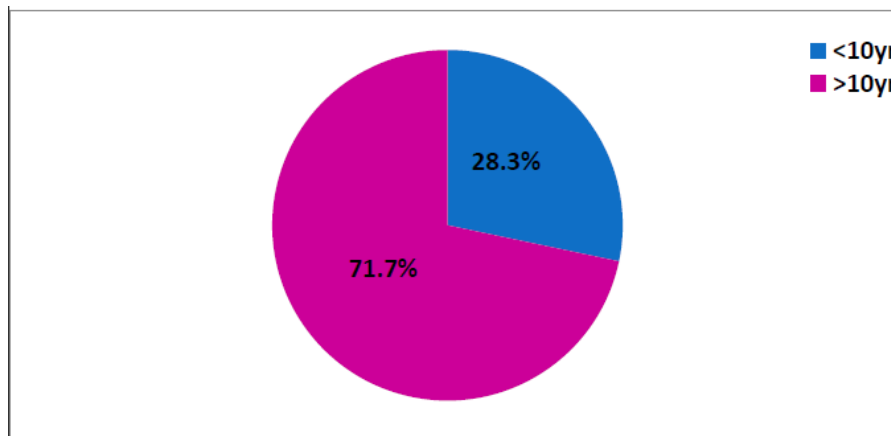

Fig (1)

Fig 2

Tab (1)

	CASE	CONTROL	P-VALUE
CHOLESTEROL Mean ± SD	173.69±31.7	153.85±33.4	0.01
TG Mean ± SD	152.91±68.9	115.40±41.6	0.02
LDL Mean ± SD	108.52±41.2	90.29±18.4	0.02
HDL Mean ± SD	46.1±16.6	48.99±10.9	0.04

Tab (2)

Dyslipidemia	Degree of AGA						P-value
	II	**III**	**IV**	**V**	**VI**	**VII**	
CHOL	0(0%)	2(10%)	4(23.5%)	4(50%)	2(66.7%)	2(100%)	0.01
TG	2(20%)	4(20%)	5(29.4%)	7(87.5%)	2(66.7%)	2(100%)	0.04
LDL	1(10%)	5(25%)	7(41.2%)	6(75%)	1(33.3%)	2(100%)	0.02
HDL	3(30%)	8(40%)	10(58.8%)	7(87.5%)	0(0%)	1(50%)	0.04

Tab 3

Serum lipids	Pearson Correlation	P-value
CHOL	0.35	0.01
TG	0.28	0.02
LDL	0.21	0.04
HDL	- 0.25	0.04

CONCLUSION

Androgenetic alopecia was associated with elevated levels of cholesterol, triglycerides, low-density lipoprotein, and low levels of high-density lipoprotein.

The duration of androgenic alopecia and the degree of androgenic alopecia constitute a risk factor for the occurrence of dyslipidemia levels in patients, with a positive correlation between the duration of the disease and the levels of cholesterol, TG, LDL, and an inverse relationship with HDL.

The value of body mass index (BMI) and age in patients with androgenic alopecia are not related to the occurrence of abnormal blood lipid levels.

REFERENCES

1. Bolognia Textbook Of Dermatology 4th edition. Chapter 69.
2. Al-Sadat Mosbeh, MD, Mostafa Ismail, MD, Abdalaleem Elgendy, MD. Dyslipidemia in patients with early onset androgenetic alopecia and risk of coronary artery disease. The Gulf of Dermatology and Venereology, April 2014; 21: 1.
3. Iram Qazi, Mohd Rafiq Tilwani, Nahida Nabi. Association of Dyslipidemia and Androgenetic Alopecia: A Case Control Study. International Jornal of contemporary Medical Research, July 2019.
4. L.Rudnicka, A.Rakowska. Dyslipidemia in patients with androgenetic alopecia. Statins finasteride or both?. JEADV, 2017; 31: 921-922.
5. Salvador ARIAS-SANTIAGO, Maria Teresa GUTIEREZ-SALMERON, Agustin BUENDIA-EISMAN, Maria Sierra GIRON-PRIETO and Ramon NARANJO- SINTES. A Comparative Study of Dyslipidaemia in Men and Women with Androgenic Alopecia. Journal Compilation 2010 Acta Dermato- Venereologica. ISSN 0001-5555.
6. Roopesh Gowda, Kanaan Gopalan, Muthusamy Kundasamy, Navakumar Manickam. Dyslipidemia in male AGA: Is it more prevalent than we think?. IP Indian Journal of Clinical and Experimental Dermatology, April- June, 2019; 5(2): 116-120.
7. TUGBA AKIN, ZEKAYI KUTLUBAY, OZGE ASKIN. THE COMPARISON OF BLOOD LIPID PROFILE IN PATIENTS WITH AND WITHOUT ANDROGENETIC ALOPECIA. TURK ACAD DERMATOL, 2020; 14: 1 12 18.