Female Pattern Alopecia and Lipoproteins

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ABSTRACT:

BACKGROUND:
The meaningful association of androgenetic alopecia and coronary heart disease had been well documented, but few studies had been focused on the importance of lipid parameters in patients with androgenetic alopecia.

OBJECTIVE:
To investigate the lipid profile and its relation to female pattern alopecia.

PATIENTS & METHODS:
This is a case controlled study conducted at the Department of Dermatology & Venereology-Baghdad Teaching Hospital, between January 2001 and April 2002. Sixty female patients with androgenetic alopecia were enrolled in this work. From each patient a detailed history and full clinical examination were performed regarding all demographic points relative to the disease, grading of alopecia and measurement of serum lipoproteins was done. Female pattern alopecia was classified according to Sharquei's classification
Sixty age and weight matched females with normal hair status were considered as a control group. Measurement of serum lipoproteins also performed for them.

RESULT:
Sixty patients, their ages ranged between 20-60 years with mean $\pm$ SD of 30.3 $\pm$ 9.4 years. Twenty (33.3%) patients were having grade I, 20 (33.3%) patients grade II and another 20 (33.3%) patients grade III.. The mean levels of total serum cholesterol, triglycerides, low density lipoprotein and very low density lipoprotein in all patients and those with grade II and III separately were significantly higher when compared to the control group. On the other hand, the mean levels of high density lipoprotein in all patients and those with grade I and III separately were lower in comparison to the control.

CONCLUSION:
The atherogenic index or risk ratio was found to be significantly high in patients with female patteren alopecia and this goes parallel with the severity of baldness.

KEY WORDS: female pattern alopecia, lipoproteins, ischemic heart disease.

INTRODUCTION:

Androgenetic alopecia is an androgen dependant, genetically mediated (autosomal dominant with variable penetrance), although polygenic inheritance can not be excluded. It occurs in approximately in 50% of both men and women.[1,2]

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In females androgentic alopecia reveals central thinning of the scalp hairs giving an appearance of ''Christmas tree pattern'' of hair loss.[3] Hamilton produced a grading scale[4] that was modified by Norwood.[5]
Another classification was proposed by Ludwig Erich.[6] However Sharquei's classification in 1993 was proposed to fit the patients with female pattern alopecia in Iraqi women.[7]
Lipoproteins consist of small particles that transport lipids in circulation. Several disorders of lipoprotein metabolism promote the development of coronary heart diseases.[8] There are many clinical reports that associate male pattern alopecia with coronary heart disease.[9] So the aim of this

study is to investigate lipid profile and its relation to female pattern alopecia.

PATIENTS AND METHODS:

This is a case controlled study carried out in the Department of Dermatology & Venereology-Baghdad Teaching Hospital, between January 2001 and April 2002.

Sixty female patients with androgenetic alopecia were included in this work. From each patient a detailed history was taken regarding age, duration of the disease, family history (1st and 2nd degree relatives) of the same condition, family history of ischemic heart disease and history of drug intake especially contraceptive pills and anabolic steroids.

For each patient a careful physical examination of the hair was performed including the hair texture, variability of hair shaft diameters, grading of alopecia, presence of acne and hirsutism. They were divided according to Sharquei's classification into the following grades:

Grade I: Bitemporal recession.

Grade II: Perceptible thinning with or without grade I

Grade III: Pronounced thinning with or without grade I

Grade IV: Total or almost total denudation of the crown with or without grade I.

Twenty age and weight matched females with apparently normal hair status were considered as a healthy control group. All patients and the control group were investigated for fasting serum lipid profile including:

- Total serum cholesterol
- Serum triglyceride (TG).
- Serum high density lipoprotein- cholesterol (HDL-C).
- Serum low density lipoprotein- cholesterol (LDL-C).
- Serum very low density lipoprotein- cholesterol (VLDL-C).

This study was approved by the ethical committee.

Descriptive statistics: frequencies, relative frequencies, means and standard deviation and percentage.

Analytical statistics: t-test was used to evaluate the difference between these variables for the grades of alopecia and control. P value = or <0.05 considered significant.

RESULTS:

Sixty patients, their ages ranged between 20-60

years with a mean $\pm$ SD of 30.3 $\pm$ 9.4 years, their weights ranged from 40-87 Kg with a mean $\pm$ SD of 64.4 $\pm$ 11.02 Kg.

Family history of female pattern alopecia in first degree relatives was positive in 42 (70%) patients: 15(75%) in grade I, 12 (60%) in grade II and 15(75%) in grade III.

Family history of female pattern alopecia in second degree relatives was positive in 25 (14.6%) patients: 10(50%) in grade I, 9 (45%) in grade II and 10(50%) in grade III.

Family history of ischemic heart disease was positive in 32 (53.3%) of patients: 13(65%) grade I, 9 (45%) grade II and 10(50%) grade III.

Twenty (33.3%) patients for each grade (I, II and III) were evaluated. No patient having grade IV was seen. A control group of twenty normal females, their ages ranged between 20-59 years with mean $\pm$ 30.9 $\pm$ 9.6 and their weights ranged from 40-85 Kg with a mean $\pm$ SD of 63.8 $\pm$ 10.8.

Associated abnormalities and diseases were detected as follows:

- Menstrual irregularities were detected in 19 (31.6%) patients: 6 (30%) grade I, 4(20%) grade II and 945%) grade III.
- Hirsutism of the chin only was detected in 11(18.3%) patients: 5(25%) grade I, 2(10%) grade II and 4(20%) grade III.
- Acne vulgaris was detected in 12 (20%) patients: 3 (15%) grade I, 5(25%) grade II and 4(20%) grade III.

The mean $\pm$ SD of serum cholesterol, TG, LDL, VLDL and HDL were shown in table 1.

Cholesterol and serum lipoproteins

Total patients: cholesterol and serum lipoproteins were statistically significant (P<0.001) in patients when compared with the control. (Table- 2).

Grade I: no statistically significant difference were noticed in different parameters of serum lipids (P>0.05), apart from HDL level was statistically high in control when compared with patients (P=0.05). (Table –3).

Grade II: the serum levels of cholesterol, TG, LDL and VLDL were statistically significant in patients than in control (P=0.05, P<0.05 and P<0.05 respectively), while HDL was lower than control but did not reach a significant level (P>0.05). (Table –3).

Grade III: the serum level of all lipids was statistically significant (P<0.05). (Table –3).

Table 1: The age groups and the number of patients in each, together with serum levels of cholesterol, TG, LDL, VLDL and HDL among patients with female pattern alopecia.

age	number	%	Cholesterol Mean±SD mg/d	TG Mean±SD mg/dl	LDL Mean±SD mg/dl	VLDL Mean±SD mg/dl	HDL Mean±SD mg/dl
20-29	33	55	210.60±53.61	101.75±50.48	139.57±45.59	20.15±10.12	52.72±14.85
30-39	19	31.6	183.47±55.83	92.47±46.97	112.52±51.64	18.57±9.47	49.26±8.58
40-49	5	8.3	174±56.72	119.8±48.69	101.2±53.41	23.8±9.57	48.8±9.41
50-59	1	1.6	125	50	60	10	55
60-69	2	3.3	162.5±10.60	82.5±24.74	92.5±3.53	16.5±4.94	53.5±12.02

Table 2: The mean ± SD of serum lipids in patients and control groups.

	Number	Cholesterol Mean±SD mg/dl	TG Mean±SD mg/dl	LDL Mean±SD mg/dl	VLDL Mean±SD mg/dl	HDL Mean±SD mg/dl
Control	20	166.75±28.57	71.95±28.91	94.55±31.78	14.35±5.79	57.7±21.71
Patients	60	196±53.9	99.3±2.39	122.7±12.86	19.8±0.47	48.8±10.8
P value between patients & control		<0.001	<0.001	<0.001	<0.001	<0.01

Table 3: The mean ± SD of serum lipids in different grades of patients with female pattern alopecia and control groups.

	Number	Cholesterol Mean±SD mg/dl	TG Mean±SD mg/dl	LDL Mean±SD mg/dl	VLDL Mean±SD mg/dl	HDL Mean±SD mg/dl
Control	20	166.75±28.57	71.95±28.91	94.55±31.78	14.35±5.79	57.7±21.71
Grade I	20	174.5±41.60 *NS	97±41.17 *NS	107.85±39.08 *NS	19.4±8.23 *NS	47.25±8.71 P=0.05
Grade II	20	196.5±58.46 P=0.05	98.35±46.25 P<0.05	121.25±52.73 P=0.05	19.69±16 P<0.05	53.85±9.35 *NS
Grade III	20	206.3±59.9 P<0.05	102.65±56.38 P<0.05	139.25±50.55 P<0.05	20.5±11.23 P<0.05	46.55±8.15 P<0.05

*NS = not significant

Table 4: The frequency distribution of age by the atherogenic index among patients and control.

	Number	Age Mean±SD mg/dl (years)	Atherogenic index Mean±SD mg/dl	T test	P value
Grade I	20	28.15±5.39	3.7±1.37	2.96	0.09 *NS
Grade II	20	33±10.38	3.9±1.28	5.47	<0.05
Grade III	20	28.7±9.02	4.5±1.51	15.25	<0.01
Total	60	30.3±9.45	4.08±1.43	7.71	<0.001
Control	20	30.8±9.35	3.1±1.06		

DISCUSSION:

Female pattern alopecia is a common problem in Iraqi females. [7] In the present study family history of female pattern alopecia in the first degree relatives was positive in 70% of cases. This result

is parallel to the family history of ischemic heart disease which was 53.3%. This corresponds to what had been mentioned that family history of female pattern alopecia was considered as one of the minor risk factors for coronary heart disease.[10] Similar results was also stated that there was a weak association between baldness in men and ischemic heart disease. [11]

Another study was showed an association between the risk of coronary heart disease in men with androgenetic alopecia. It also showed a similar results of lipid parameters to the present study.[12]

This study showed that female pattern alopecia was associated with acne in 20% of cases and with hirsutism in 18.3%. these figures were slightly higher than what had been reported in previous Iraqi study.[7]

In the present study androgenetic syndrome was seen in 8.3%, this association is probably coincidental and there is no solid foundation to this entity.

There are many classifications of baldness in female pattern alopecia like Hamilton and Ludwig.[4] Hamilton grading is so much complicated that is can not be applied easily and practically in female pattern alopecia, while the Ludwig classification completely ignore the bitemporal recession with more stressing upon frontal fringe which is absent in Iraqi females in previous study.[7] The present work found frontal fringe to be present in 3.3% of females. So we think that Sharquei's classification is the most suitable and practical at least for Iraqi female pattern alopecia.

The association between female pattern alopecia, athersclerosis and ischemic heart disease is unfortunately not taken in consideration neither clinically nor biochemically.

The present study to the best of our knowledge is the only one that stressed upon this problem.

CONCLUSION:

The atherogenic index was found to be significantly high in patients with female pattern alopecia and this goes parallel with the severity of baldness. Also a family history of female pattern alopecia was considered as one of the minor risk factors for coronary heart disease.

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