

Original Article

Prevalence of androgenic alopecia in women of 20-70 years in Isfahan during 2008-2009

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Abstract *Background* Androgenetic alopecia is the most common form of hair loss that is progressive, diffuse and symmetric affecting both sexes. Several studies about the prevalence and pathophysiology of androgenetic alopecia in women have been done that show the importance of this problem.

Objective To study the prevalence of androgenetic alopecia in women in our society, the first step for this research in this field.

Patients and methods This was a descriptive study done in a busy barbershop in Isfahan during 2008-2009. All women in the age range from 20 to 70 years who visited these units were enrolled. Simple and non random sampling method was used and total 1800 women were checked for androgenic hair loss. In patients with alopecia, ferritin levels were also checked.

Results Of 1800 women studied, 39.6% had androgenetic alopecia. Average age of women with hair loss was 50.4 years and the average age of women without it was 31.9 years ($p < 0.001$). In 36% of patients with androgenetic alopecia ferritin levels were less than 40 $\mu\text{g/L}$, not significantly different from normal levels in the society, but the severity of androgenetic alopecia more in people who had levels of ferritin under 40 $\mu\text{g/L}$.

Conclusion In this study, prevalence of androgenetic alopecia was higher than previous studies conducted in other countries that can be due to inherited or racial factors. Serum ferritin levels should also be checked and treated in women with androgenetic alopecia.

Key words

Androgenetic alopecia, prevalence, ferritin

Introduction

Androgenetic alopecia (AGA) is a type of hair loss which occurs in genetically susceptible men and women in a specific pattern. "Andro" in the word of "androgenetic" depicts the effect of androgens such as testosterone and dihydrotestosterone (DHT) whereas 'Genetics'

refers to the fact that genes for AGA are inherited from one or both parents.¹ AGA is the most common form of alopecia characterized by progressive, symmetric and pattern hair loss. Pathophysiologically, in both sexes, hair thickness or density is reduced. Following two criteria are necessary for diagnosis of androgenetic alopecia: A) Hair loss conforms with one of the pattern of hair loss e.g. Ludwig, Hamilton etc. and B) Family history of hair loss i.e. there is an affected person.² Pattern hair loss in women is different from men.³ Following forms can be seen: 1. Ludwig pattern: low density occurs over the central part of the scalp

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and hair loss is subclassified into 3 types.^{4,5} 2- Christmas tree pattern: frontal hairline retreats and increased hair loss towards the frontal line, sometimes widened hair part.⁶ 3-Hamilton pattern: a hair loss similar to pattern hair loss in men and the subdivision into 8 types.^{7,8} 4- Early onset of hair loss occurring at occiput which is more open.⁹ 5-Bitemporal recession: with hair growing line retreats in temporal area on both sides.⁴

So far different studies regarding the prevalence and its pathophysiology of AGA have been conducted in different countries. In our country, there is also dire need for studies in this field and the first step is to determine the prevalence androgenetic alopecia in women.

Patients and methods

This was a descriptive study that was done in a busy ladies barbershop in Isfahan during 2008-2009. Simple nonrandom sampling method was used. Assuming the prevalence of androgenetic alopecia as 25%, sample size was calculated to 1800 (95% confidence level, error means 0.02).

Only women giving informed consent were enrolled in the study. Exclusion criteria for study were: pregnancy, recent childbirth, breastfeeding, menstrual problems, acne resistant to treatment, scalp disorders, change in the frequency of sound, having muscular limbs, renal failure, heart disease, uncontrolled diabetes, organ transplantation, psoriasis, medications such as estrogen and progesterone, isotretinoin, finasteride, tamoxifen etc. Enrolled females were checked for female pattern hair loss (FPHL) and categorized as: Ludwig, Christmas tree, early onset of hair loss and the bitemporal recession. The family history of hair loss was also asked.

These two criteria were necessary for the diagnosis of AGA: A) One of the patterns of hair loss should be present. B) Family history of hair loss should be positive.

Ferritin levels were also determined in patients with FPHL, using cut off limit of 40 µg/L.¹⁰ Decreased levels were correlated with severity of hair loss.

Study data were analyzed by statistical software SPSS version 17. Chi-square test and, if necessary, Fisher exact test were used for qualitative relationship between the variables. Student t student test was used for the relationship between quantitative variables.

Results

In this study, 1800 women were studied. The mean age of these was 36±15.3 years and range age was 20-70 years of old. 712 cases were suffering from AGA/FPHL, with a prevalence of 39.6%. Average ages of women with hair loss were 50.4 years and 31.9 years in women without it, respectively which was significantly different ($p<0.001$)

The prevalence of AGA in the age group under 30 years was 25%, in 30-39 years old group was 35.6%, in 40-49 years old group was 43.6%, in 50-59 years old group was 55.2% and in ≥60 years old group was 79.9%. Chi-square test also showed that the prevalence of hair loss in different age groups is statistically significant ($p<0.001$).

All patterns of hair loss were recorded. A patient could have more than one pattern. Out of 712 women who had hair loss, 683 (95.9%) patients were classified as Ludwig pattern and 29 (4.1%) had only bitemporal recession. Amongst 683 patients with Ludwig pattern, 297 (41.7%) had

type I, 347 (48.7%) had type II and 39 (4.9%) had type III Ludwig pattern.

265 (37.2%) patients had Christmas tree pattern hair loss. All these patients also fell in one of the three types of Ludwig pattern.

101 (14.2%) cases had bitemporal recession, 29 of them had bitemporal recession only and did not have Ludwig or other classification pattern. 9% (64 cases) had early onset hair loss pattern.

Ferritin levels were determined in 712 patients with AGA. 256 (36%) cases had levels under 40 µg/L, and in 456 (64%) cases levels were 40 µg/L or higher. Considering that over 30% of the community, have ferritin less than 40 µg/L,¹¹ the student t test did not show significant difference between the two groups (patients with AGA vs. society). On the other hand, 21.5% of patients with type I Ludwig pattern had ferritin levels lower than normal. In type II, 48.4% and in type III 71.4% with ferritin were below normal. Chi-square test showed a significant correlation between ferritin level and grade Ludwig grade ($p < 0.001$) i.e. with decreased ferritin level Ludwig grade will increase.

Discussion

In our study, the prevalence of AGA in women of our society was 39.6%, higher than that reported in other studies around the world i.e. about 20%.¹² Prevalence of FPHL in 20-30 years old Caucasian females was 6-12%. Prevalence is lower in Asian females so that the prevalence of 2.3% for 30 years old, 3.83% for 40 years old, 7.4% for 50 years old, 11.7% for 60 years old and 24.7% for 70 years old women has been reported.¹³

Brich *et al.*¹⁴ in their study concluded that 6% of women below 50 years of age and 38% of

women 70 years of age have Ludwig pattern hair loss.

Another study from Korea reported 5.6% prevalence of FPHL, lower than European women.¹⁵

Higher prevalence rate in the present study than previous studies can be due to inherited or racial factors. Another reason can be that all patterns of hair loss e.g. Ludwig, Christmas tree etc. were more carefully scrutinized.

Prevalence of androgenetic alopecia and age of patients had a significant correlation, a quite well known fact that influence of androgen factors increases with age, especially after menopause, prevalence rises.⁷

In this study, 36% of patients had titer of ferritin less than 40 µg/L, although similar to figures in the community, but those who had ferritin levels less than 40 µg/L, the severity of androgenetic alopecia increased significantly, which indicates depletion of iron stores in body intensify the grade androgenetic alopecia.

In conclusion, while dealing with women with androgenetic alopecia, serum levels of ferritin should also be measured. Also, the high prevalence of FPHL in our country necessitates search for other risk factors and appropriate treatment studies.

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References

1. Milan DF. Risk factors in androgenetic alopecia in Nederland population. *SanSan Poblsh* 2002; **8**: 20-9.
2. Slen EA. Androgenetic alopecia. In: Oslen EA, ed. *Disorders of Hair Growth*. New York: Mc Graw-Hill; 1994. P. 257-83.
3. Nilforoushzadeh M. Androgenetic alopecia information. Available from: www.drnilforoushzadeh.ir/index.php?ToDo=ShowArticles&AID=140
4. Rosenbeen FF, ed. *Androgenetic Alopecia*. Philadelphia: Elsevier Publishing; 2003.
5. Oslen EA, ed. *Disorders of Hair Growth*. New York: Mc Graw-Hill; 1994.
6. Sinclair R. Male pattern androgenetic alopecia. *Br Med J* 1998; **317**: 8659.
7. Oslen EA: The midline part: An important physical clue to the clinical diagnosis of androgenetic alopecia in women. *J Am Acad Dermatol* 1999; **40**: 106-109.
8. Takashima I. Androgenetic alopecia: pathophysiological aspects in man and animals. In: Orfanose CE, Happle R, eds. *Hair and Hair Diseases*. Berlin: Springer-Verlag; 1990. P. 467-84.
9. Ludwig E. Classification of the types of androgenetic alopecia (common baldness) occurring in the female sex. *Br J Dermatol* 1977; **97**: 247-57.
10. Dawber R.P.R, de Berker D. Disorders of hair. In: Champion RH, Burton JL, Burns T, Breathnach S. *Rook's Textbook of Dermatology*, 6th edn. London: Blackwell Science; 1998. P. 2917.
11. Britenham GM. Disorders of iron metabolism. In: Edward R, Hofman J. Benz HJ, eds. *Hematology: Basic Principles and Practice*. Pennsylvania: Elsevier; 2005. P. 481.
12. Setty LR. Hair patterns of the scalp of white and Negro males. *Am J Phys Anthropol* 1970; **33**: 49-55.
13. Nyholt, DR, Gillespie NA, Heath AC, Martin NG. Genetic basis of male pattern baldness. *J Invest Dermatol* 2003; **121**: 1561-4.
14. Brich P, Messenger JF, Messenger AG. Hair density, hair diameter and the prevalence of female pattern hair loss. *Br J Dermatol* 2001; **144**: 297-304.
15. Lee WS, Ro BI, Hong SP *et al*. A new classification of pattern hair loss that is universal for men and women: Basic and specific (BASP) classification. *J Am Acad Dermatol* 2007; **57**: 37-46.

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