ORIGINAL RESEARCH PAPER

Volume-6 | Issue-11 | November-2017 | ISSN No 2277 - 8179 | IF : 4.176 | IC Value : 78.46

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

DYSLIPIDEMIA IN EARLY ONSET ANDROGENETIC ALOPECIA

Dermatology

Pallavi Nigam* Junior Resident, Department of Dermatology, Venereology and Leprosy, Bharati Vidyapeeth University Medical College, Pune. *Corresponding Author

V.R. Sardesai Professor and Head, Department of Dermatology, Venereology and Leprosy, Bharati Vidyapeeth University Medical College, Pune.

ABSTRACT

Alopecia induced by androgens in genetically predisposed individuals is termed androgenetic alopecia. Androgenetic alopecia has been associated with an increased risk of coronary heart disease in various studies. The relationship between androgenic alopecia (AGA) and metabolic syndrome, a known risk factor for atherosclerotic cardiovascular disease, is still poorly understood. The lipid profile in randomly selected 50 cases between the age of 20-50 years, clinically diagnosed with Androgenetic Alopecia (AGA) of Norwood-Hamilton grade II or above and 51 controls without Androgenetic Alopecia was studied. Data collected included personal and family history, and treatment history. Fasting lipid profile was investigated. Chi-square test and Fischer's exact test were used for statistical analysis. Dyslipidemia was seen in 6 (12%) patients with androgenic alopecia and 0 (0%) controls (p-value = 0.011). Positive family history, Dyslipidemia and Triglycerides were significantly higher in patients with Androgenetic Alopecia.

KEYWORDS

Lipid profile, Pattern hair loss, Androgens, metabolic syndrome

Introduction:

Androgenetic Alopecia (AGA) has been recognized as an androgen dependent hereditary disorder. A balding scalp is characterized by high levels of the potent androgen dihydrotestosterone and an increased expression of the androgen receptor gene.[1] Studies suggest that variations in the AR gene lead to increased activity of androgen receptors in hair follicles.[2] In many studies, AGA has been shown to be associated with several diseases, such as coronary heart disease,[3,4] insulin resistance,[5] hypertension,[6] abnormal serum lipid profiles,[3,5,7] obesity,[8] prostate cancer,[9] benign prostatic hyperplasia,[10] and some environmental factors, such as smoking.[8,11] However, controversies also exist regarding the association of those diseases and environmental factors with AGA.[12,13,14,15,16] The aim of the present study was to find out the correlation between serum androgen levels and severity of AGA and its association with dyslipidemia, confirms the importance of Androgenetic alopecia as a surrogate marker for coronary artery disease in Indian patients. Patients with AGA in the age group of 20 to 50 years and to compare them with controls. This age group was chosen because usually CAD may not be present in this age but risk factors would have started developing.

Material & Methods:

In this hospital based, case control study, 50 patients with AGA and 51 age-matched controls attending the skin outpatient department of dermatology were included. Men and women in the age group 20–50 years with clinically diagnosed early-onset androgenic alopecia (age <35 years) with Norwood type II or above were included as cases. Men and women aged between 20-50 years with a dermatological disease other than androgenic alopecia were included as controls. The study was limited to patients <50 years of age due to the increase in the prevalence of with testosterone, those on corticosteroid therapy and those with hypothyroidism and patients with history of smoking were excluded to minimize the role of other variables in the pathogenesis of androgenic alopecia and metabolic syndrome.

After obtaining informed consent, detailed history and clinical examination were conducted and the details entered in a proforma. The history included age, occupation, duration of alopecia (based on patient history), treatment details for alopecia, smoking and alcohol consumption. Personal history of drug history for hypertension, diabetes mellitus and dyslipidemia was obtained. Diagnosis of Androgenetic Alopecia was based on history and clinical findings including early age of onset (<35 years) and pattern of increased hair thinning on frontal and parietal scalp with greater hair density on the occipital scalp. Family history of androgenic alopecia was also noted. The degree of Androgenetic Alopecia was based on the Norwood scale (II–VII). Data on weight, height and blood pressure was recorded. Fasting complete lipid profile were analyzed in blood samples drawn after a 10 hours of fasting.

For grading of Androgenetic Alopecia in males Norwood-Hamilton grading is used and in females Ludwig's scale is used. For diagnosing Dyslipidemia, The National Cholesterol Education Program Blood Lipid guidelines for optimal blood lipid levels, were used:- Total Cholesterol < 200 mg/dl, HDL Cholesterol > 60 mg/dl. LDL, Cholesterol <100 mg/dl, Serum Triglycerides < 150 mg/dl. For detecting serum testosterone, we used, Male: 142.39-923.14 ng/dl and in Female: 10.83-56.94 ng/dl

For statistical analysis the following tests were applied, Chi square test and Fischer's exact test, using the software SPSS (Statistical Package for Social Sciences) 20.0. Qualitative variables were analyzed with a Chi-square test. $P < 0.05$ was considered significant.

Results:

The distribution of patients is shown in table 1 & 2. The distribution of patients according to Norwood-Hamilton grading is shown in table 3. The prevalence of Androgenetic Alopecia was found to be higher in males than females in a ratio 2.3 : 1. Majority of patients (72%) belonged to 20-30 years of age in the study group. Most commonly observed grade of Androgenetic Alopecia in males was Norwood-Hamilton grade 3A seen in 28.58% cases. Similarly, most common grade of Androgenetic Alopecia in females was Ludwig's grade 2. There was a significant association between family history of androgenetic alopecia in cases as compared to controls (p-value < 0.05). Abnormal triglyceride levels were observed in 24% cases with androgenetic alopecia as compared to 7.8% of controls which was significantly higher (Table 4). There was a significant association between Dyslipidemia of cases and controls (p-value < 0.05).

Discussion:

Multiple studies have shown a higher incidence of the disease in males. In a study by Krupashankar et al, they conclude that the prevalence of AGA in the male population between the ages of 30 and 50 years was 58%. In our study group, 35(70%) cases were males and 15(30%) cases were females (Table 1). Thus in our cases of Androgenetic Alopecia group, a high male:female ratio of 2.3:1 was observed.

Our study shows, a significant association between the positive family history and development of Androgenetic Alopecia in cases (Table 2). In contrast to the Korean study, the proportion of Chinese men with a positive family history was higher, suggesting that genetic background is important for determining the prevalence of AGA in Chinese men, and confirming that subjects with positive family histories are at greater risk of developing severe AGA (Su and Chen, 2007).[11]

The most common grade of Androgenetic Alopecia in our study was Norwood-Hamilton grade 3, with 10 (28.57%) out of 35 patients having androgenetic alopecia of this grade. This was followed by grade 2V with 20% cases, grade 3 and grade 3V with 17.14% cases, grade 2

and grade 4 with 5.71% cases and 2.8% cases with grade 2A and grade 5 androgenetic alopecia (Table 3). A large study in the Indian population had type II as the commonest presentation of AGA (Grover, 2005).[19] Another study in an Indian population had type II and III as the commonest presentation (Sehgal et al, 2007).[18]

To detect the association of dyslipidemia, we analysed the fasting blood lipid levels of 50 cases and 51 controls and found there is significant association between Triglyceride levels and Total Dyslipidemia of with cases and controls (Table 4 and Table 5). Arias-Santiago et al[17] (2010) studied 300 patients, men with androgenic alopecia showed significant higher triglycerides values (159.7 vs 128.7 mg/dl, p = 0.04) total cholesterol values (198.3 vs 181.4 mg/dl, p = 0.006) and LDL-C values (124.3 vs 106.2, p = 0.0013) versus non-alopecic men. A higher prevalence of dyslipidemia in women and men with androgenic alopecia was found. Sadighha et al[7] studied the lipid profile of men with AGA, and found significantly higher levels of triglyceride and total cholesterol/HDL-cholesterol ratio in men with AGA and significantly lower HDL-C values.

Table 1: Distribution of patients.

Gender	Group				Total
	Cases	Percentage	Controls	Percentage	
Male	35	70%	21	41.1%	56
Female	15	30%	30	58.8%	45
Total	50	100%	51	100%	101

Table 2: Distribution of patients according to family history of androgenetic alopecia.

Family History	Group				Total	p-value
	Cases	Percentage	Controls	Percentage		
Positive	27	54%	14	27.45%	41	0.009
Negative	23	46%	37	72.54%	60	
Total	50	100%	51	100%	101	

Table 3: Distribution of patients according to grading of Androgenetic Alopecia in males.

GROUP	Number of cases	Percentage
Norwood-Hamilton grade 2	2	5.71%
Norwood-Hamilton grade 2A	1	2.8%
Norwood-Hamilton grade 2V	7	20%
Norwood-Hamilton grade 3	6	17.14%
Norwood-Hamilton grade 3A	10	28.57%
Norwood-Hamilton grade 3V	6	17.14%
Norwood-Hamilton grade 4	2	5.71%
Norwood-Hamilton grade 4V	0	0
Norwood-Hamilton grade 5	1	2.8%
TOTAL	35	100%

Table 4: Triglyceride levels in patients and control group.

Triglycerides Level	Group				Total	p-value
	Cases	Percentage	Controls	Percentage		
Abnormal	12	24%	4	7.84%	16	0.031
Normal	38	76%	47	92.15%	85	
Total	50	100%	51	100%	101	

References:

1. Narad S, Pande S, Gupta M, Chari S. Hormonal Profile in Indian Men with Premature Androgenetic Alopecia Int J Trichology. 2013 Apr-Jun; 5(2): 69–72. doi: 10.4103/0974-7753.122961.
2. Kaliyadan F, Nambiar A, Vijayaraghavan S. Androgenetic alopecia: An update. Indian J Dermatol Venereol Leprol 2013;79(5):613-25. doi: 10.4103/0378-6323.116730.
3. Sasmaz S, Senol M, Ozcan A, Dogan G, Tuncer C, Akyol O, et al. The risk of coronary heart disease in men with androgenetic alopecia. J Eur Acad Dermatol Venereol 1999;12:123-5.
4. Mansouri P, Mortazavi M, Eslami M, Mazinani M. Androgenetic alopecia and coronary artery disease in women. Dermatol Online J 2005;11:2.
5. Matilainen V, Koskela P, Keinänen-Kiukaanniemi S. Early androgenetic alopecia as a marker of insulin resistance. Lancet 2000;356:1165-6.
6. Ahouansou S, Le Toumelin P, Crickx B, Descamps V. Association of androgenetic alopecia and hypertension. Eur J Dermatol 2007;17:220-2.
7. Sadighha A, Zahed GM. Evaluation of lipid levels in androgenetic alopecia in comparison with control group. J Eur Acad Dermatol Venereol 2009;23:80-1.
8. Mosley JG, Gibbs AC. Premature grey hair and hair loss among smokers: A new opportunity for health education? BMJ 1996;313:1616.
9. Hawk E, Breslow RA, Graubard BI. Male pattern baldness and clinical prostate cancer in the epidemiologic follow-up of the first National Health and Nutrition Examination Survey. Cancer Epidemiol Biomarkers Prev 2000;9:523-7.
10. Oh BR, Kim SJ, Moon JD, Kim HN, Kwon DD, Won YH, et al. Association of benign prostatic hyperplasia with male pattern baldness. Urology 1998;51:744-8.
11. Su LH, Chen TH. Association of androgenetic alopecia with smoking and its prevalence among Asian men: A community-based survey. Arch Dermatol 2007;143:1401-6.
12. Nabaie L, Kavand S, Robati RM, Sarrafi-Rad N, Kavand S, Shahgholi L, et al. Androgenic alopecia and insulin resistance: Are they really related?. Clin Exp Dermatol 2009;34:694-7.
13. Shahar E, Heiss G, Rosamond WD, Szklo M. Baldness and myocardial infarction in men: The atherosclerosis risk in communities study. Am J Epidemiol 2008;167:676-83.
14. Abdel Fattah NS, Darwish YW. Androgenetic alopecia and insulin resistance: Are they truly associated? Int J Dermatol 2011;50:417-22.
15. Matilainen V, Laakso M, Hirsso P, Koskela P, Rajala U, Keinänen-Kiukaanniemi S. Hair loss, insulin resistance, and heredity in middle-aged women- A population-based study. J Cardiovasc Risk 2003;10:227-31.
16. Severi G, Sinclair R, Hopper JL, English DR, McCredie MR, Boyle P, et al. Androgenetic alopecia in men aged 40-69 years: Prevalence and risk factors. Br J Dermatol 2003;149:1207-13.
17. Arias-Santiago S, Gutiérrez-Salmerón MT, Castellote-Caballero L, Buendía-Eisman A, Naranjo-Sintes R. Androgenetic alopecia and cardiovascular risk factors in men and women: A comparative study. J Am Acad Dermatol 2010;63:420-9.
18. Sehgal VN, Kak R, Aggarwal A, Srivastava G, Rajput P. Male pattern androgenetic alopecia in an Indian context: A perspective study. J Eur Acad Dermatol Venereol 2007;21:473-9.
19. Grover S. A study of patterns of androgenetic alopecia in men: an Indian perspective. Br J Dermatol. 2005;152:572–574.