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Medical Comorbidities and the Onset of Androgenetic Alopecia: A Population-Based, Case-Control Study

Hee-Chul Chung, Sung Jay Choe, Solam Lee, Sung-Soo Oh[1], Won-Soo Lee

Department of Dermatology, Institute of Hair & Cosmetic Medicine, Yonsei University Wonju College of Medicine, [1]Department of Occupational and Environmental Medicine, Yonsei University Wonju College of Medicine, Wonju, Korea

Dear Editor:

An association between androgenetic alopecia (AGA) and an increased incidence of metabolic syndrome (MS) has been suggested[1]. AGA might be an indicator of arterial stiffness[2]. A higher prevalence of hypertension has been found in women with early-onset AGA, suggesting that early-onset AGA could be a risk factor for early-onset severe coronary heart disease[3,4]. This study explored differences in medical comorbidities including MS based on the timing of AGA onset.

The medical records of 1,141 subjects who visited the Department of Dermatology and the Occupational Medical Clinic in Wonju Severance Christian Hospital from October 2012 to March 2016 were analyzed retrospectively and classified into early- and late-onset AGA groups. Fifty patients with pattern hair loss who were younger than 35 years old were defined as "early-onset." For comparison, fifty late-onset AGA patients were selected randomly. To evaluate MS, we analyzed the medical history (hypertension, diabetic mellitus and alcohol drinking), blood samples (glucose, lipid profiles, hemoglobin, hematocrit, blood urea nitrogen, creatinine and liver enzymes) and anthropometric indexes (waist, height, weight, body mass index [BMI], and blood pressure) of each group. MS was defined on the basis of the NCEP-ATP III guidelines[5]. This study was approved by the Yonsei University College of Medicine Institutional Review Board (YWMR-15-0-71).

The average age of the early-onset AGA group was 33.7 years and that of the late-onset AGA group was 46.8 years, which did not represent a significant difference ($p=0.244$). The early-onset AGA group was composed of 41 males and 9 females and the late-onset AGA group was composed of 35 males and 15 females. MS was diagnosed in 9 patients in the early-onset AGA group and no patients in the late-onset AGA group. The authors used Fisher's exact test to evaluate medical history, anthropometric and blood abnormalities. The results revealed that the early-onset AGA patients had abnormal BMI, waist circumference and blood parameters relatively, however, there were no statistically significances (Table 1). The comparison of anthropometric and blood parameters using the Mann-Whitney U test revealed no significant differences other than in high density lipoprotein cholesterol level (Fig. 1), which was lower in the early-onset group ($p=0.029$).

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Corresponding author: Won-Soo Lee, Department of Dermatology, Yonsei University Wonju College of Medicine, 20 Ilsan-ro, Wonju 26426, Korea. Tel: 82-33-741-0622, Fax: 82-33-748-2650, E-mail: leewonsoo@yonsei.ac.kr

Table 1. Medical history, anthropometric and blood abnormalities of AGA patients

	Yes* or normal†	No† or abnormal§	*p*-value	Relative risk
Medical history				
Hypertension	3 (3/0)*	97 (47/50)†	0.121	
Diabetic mellitus	1 (1/0)*	99 (49/50)†	0.500	
Dyslipidemia	1 (0/1)*	99 (50/49)†	0.500	
Anthropometric indexes				
Body mass index	65 (30/35)‡	35 (20/15)§	0.295	1.556
Waist circumference	78 (36/42)‡	22 (14/8)§	0.148	2.042
Blood pressure	34 (16/18)‡	66 (34/32)§	0.673	0.837
Blood sampling				
Glucose	86 (40/46)‡	14 (10/4)§	0.074	2.875
Triglyceride	86 (41/45)‡	14 (9/5)§	0.249	1.976
HDL cholesterol	76 (34/42)‡	24 (16/8)§	0.061	2.471

Values are presented as total AGA (early-onset AGA/late-onset AGA). AGA: androgenetic alopecia, HDL: high density lipoprotein. *Yes, †no, ‡normal, §abnormal.

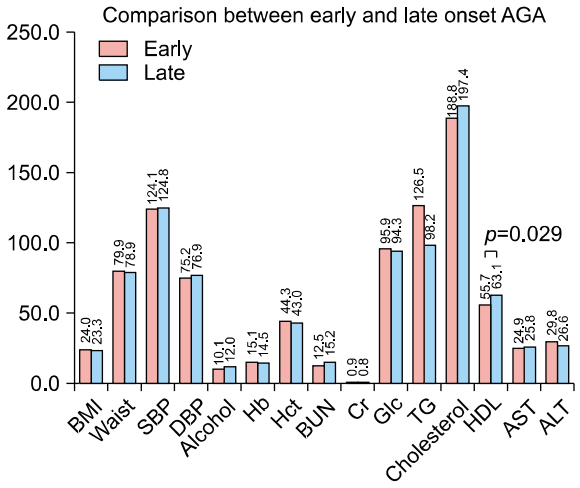

Fig. 1. Comparison between early- and late-onset androgenetic alopecia (AGA) groups. BMI: body mass index, SBP: systolic blood pressure, DBP: diastolic blood pressure, Hb: hemoglobin, Hct: hematocrit, BUN: blood urea nitrogen, Cr: creatinine, Glc: glucose, TG: triglyceride, HDL: high density lipoprotein cholesterol, AST: aspartate aminotransferase, ALT: alanine aminotransferase.

This study found significantly higher prevalence of MS in patients with the early-onset AGA vs. the late-onset AGA patients. The early-onset AGA patients might not be strongly associated with coronary artery disease risks including blood pressure, waist circumference and lipids. Other results such as blood tests and anthropometric characteristics indicate no significant relationship with early-onset AGA. AGA has been found to have higher levels of 5-a reductase and more androgen receptors despite normal level of circulating androgens. These factors may play a role in the development of medical comorbidities. There can be a selection bias in the process of sorting patients according to the onset of AGA. Furthermore, this study was limited in that it did not enroll an age-matched group and was retrospective in nature. However, this study was a population-based, large-scale investigation in South Korea that showed an association between MS and early-onset AGA.

CONFLICTS OF INTEREST

The authors have nothing to disclose.

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