

## Prevalence and types of androgenetic alopecia in north Anatolian population: A community-based study

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### Abstract

**Objectives:** To determine the prevalence and pattern of androgenetic alopecia in Turkey and to compare the results with different regions.

**Methods:** The community-based study was carried out from September 2012 to June 2013 across all the 12 districts of Tokat province of Turkey. Individuals 20-years-old or older were included, and more than two first-degree relatives were excluded. Dermatological examination of all the subjects was performed by dermatologists. The degree of androgenetic alopecia was classified according to the Hamilton-Norwood and Ludwig classifications.

**Results:** Of the 2322 volunteers, 1288(55.46%) were women and 1034(44.53%) were men. Overall mean age was 47.3±15.3 years (range: 20-87 years). Androgenetic alopecia was detected in 740(31.8%) subjects; 247(19.17%) women and 493(47.6%) men.

**Conclusions:** The prevalence of androgenetic alopecia in Turkish society was higher than Asian and African communities; and similar to the rate in European societies hair-loss

**Keywords:** Androgenetic alopecia, Prevalence, North Anatolian, Turkey. (JPMA 65: 806; 2015)

### Introduction

Androgenetic alopecia (AGA) is a hair-loss emerging in particular patterns in which systemic androgens and genetic factors play an important role.<sup>1</sup> In AGA, affected hair enter a process called follicular miniaturisation according to changes in hair growth cycle. In this process, affected hairs become thinner and less pigmented that they should be. It is the most common pathology of hair-loss in both genders. Although it is a benign pathology as a hair disease, it is important as it significantly affects the quality of life of individuals in psychological and social aspects.<sup>2</sup> Especially in women, these effects are seen more remarkably.

In AGA, different patterns of hair-loss are seen in both genders. Male type AGA starts with bitemporal recession of the frontal hairline and hair-loss in the vertex region is added to the table in the progressive stages. In type 'a', the more severe frontal recession is observed, while in type 'vertex', isolated balding patch is seen in the vertex.<sup>3</sup> In female type AGA, diffused hair-loss occurs in centroparietal area without recession of the frontal hairline.<sup>4</sup> Various classification methods have been used in order to determine the model of hair-loss and to score

the severity.<sup>3,5</sup> There are two useful classifications in male pattern AGA. Male pattern hair-loss was classified 5 and 25 years later, the classification was modified and divided the severity of alopecia into 7 stages and 5 sub-groups (I, II, IIa, III, III vertex, IIIa, IV, IVa, V, Va, VI, VII).<sup>3</sup> Today, the classification is named Hamilton-Norwood classification and used more frequently in male pattern AGA scoring. Today, in female pattern AGA scoring, three-stage classification made by Ludwig is still valid (I, II, III).<sup>6</sup>

It has been shown in many studies that there are regional differences in the prevalence of AGA and hair-loss pattern.<sup>3,5,7-9</sup> These differences are more prominent, especially among European and Asian communities.<sup>3,9</sup> In Turkey, sufficient data is not available on the prevalence of AGA and hair-loss pattern. This study was planned as the first community-based epidemiological study in Turkey which is located in a special position geographically.

### Subjects and Methods

The community-based study was carried out from September 2012 to June 2013 across all the 12 districts of Tokat province of Turkey. The study was based on Family Medicine system as all Turkish citizens are registered with the system. Initially, 85 separate sample groups (52 urban and 33 rural) were created based on 85 (50%) of the 170 units of Family Medicine located in Tokat. The volunteers were randomly selected from among individuals under the follow-up of Family Medicine unit. Each sample group

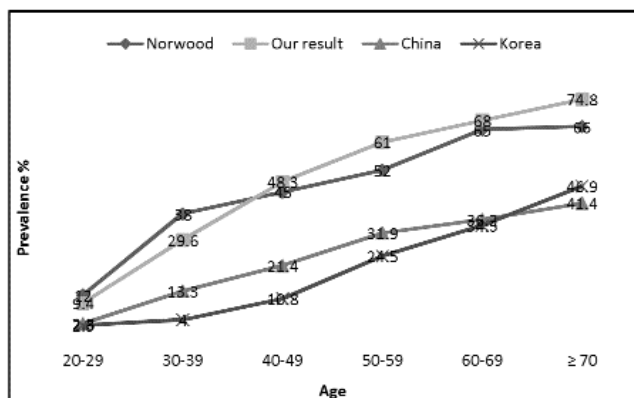
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was designed based on the Turkey Statistical Institute data reflecting population pyramid of the region (gender, age group, urban and rural settlements etc.). Only individuals 20-years-old or over were included in the study. In the same sample group, more than two first-degree relatives were not included. Dermatological examination of all volunteers was performed by three dermatology specialists. The individuals' demographic factors, dietary habits, medical history, including menstrual and childbearing history of women, were recorded. Hamilton-Norwood classification<sup>5</sup> (Type I, II, III, IIIa, III vertex, IV, IVa, V, Va, VI, VII), and Ludwig classification<sup>6</sup> (Type I, II, III) were used for AGA scoring of male and female patterns, respectively. Grade I, II and III in Hamilton-Norwood classification were defined as normal for male pattern alopecia. The volunteers were evaluated in 6 age groups: 20-29, 30-39, 40-49, 50-59, 60-69, and 70 years and over.

**Result**

A total of 2428 individuals were initially interviewed and 2322(95.6%) were included. Of the 2322 volunteers, 1288(55.46%) were women with a mean age of 46.6±15.3 years, and 1034(44.53%) were men with a mean age of 48±15.4 years. Overall mean age was 47.3±15.3 years (range: 20-87 years). Androgenetic alopecia was detected



**Figure-1:** Prevalence of androgenetic alopecia in men. Comparison with the results of three previous studies.

in 740(31.8%) subjects.

In men, the prevalence of AGA increased with age (Table-1). According to the Hamilton-Norwood classification, the most common type was type VI in 127(25.7%), while type III vertex was the least common type in 16(3.2%).

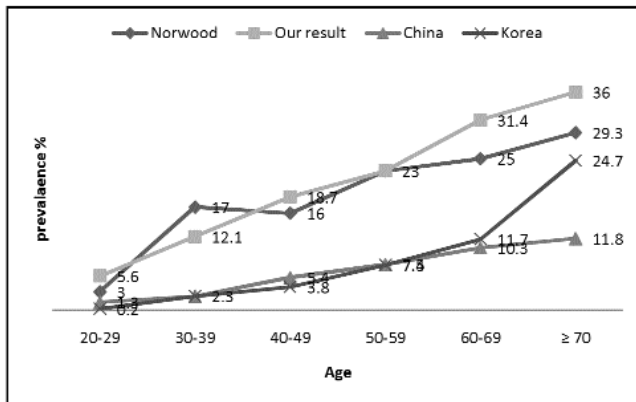
In women it's the prevalence also increased steadily with advancing age (Table-2). According to the Ludwig classification, the most common was type I in 154(62.3%),

**Table-1:** Prevalence of androgenetic alopecia in Turkish men.

	Age (years)						Total
	20-29	30-39	40-49	50-59	60-69	≥70	
III, n (%)	3 (2-3)	13 (5-5)	10 (4-8)	14 (6-4)	5 (3-4)	1 (0-9)	46 (4-4)
III vertex, n (%)	0	1 (0-4)	3(1,4)	4 (1-8)	4 (2-7)	4 (3-7)	16(1-5)
IIIa, n (%)	0	7 (3)	5 (2-4)	8 (3-6)	5 (3-4)	1 (0-9)	26 (2-5)
IV, n (%)	3 (3-1)	13 (5-5)	19 (9-2)	13 (5-9)	5 (3-4)	8 (7-4)	61 (5-8)
IVa, n (%)	1 ( )	3 (1-3)	3 (1-4)	6 (2-7)	5 (3-4)	3 (2-8)	21 (2)
V, n (%)	4 (2-3)	12 (5-1)	10 (4-8)	10 (4-5)	4 (2-7)	6 (5-6)	46 (4-4)
Va, n (%)	0	2 (0-8)	7 (3-4)	15 (6-8)	4 (2-7)	4 (3-7)	32 (3)
VI, n (%)	1 (0-8)	15 (6-4)	23 (11-2)	29 (13-3)	33 (22-4)	26 (24-3)	127 (12-2)
VII, n (%)	0	3 (1-3)	17 (8-3)	34 (15-6)	35 (23-8)	27 (25-2)	116 (11-2)
Female pattern ,n (%)	0	0	2 (0-9)	0	0	0	2 (0-2)
Total, n (%)	12 (9-4)	69 (29-6)	99 (48-3)	133 (61)	100 (68)	80 (74-8)	493 (47-5)
Total no	128	233	205	218	147	107	1038

**Table-2:** Prevalence of androgenetic alopecia in Turkish women.

	Age (years)						Total
	20-29	30-39	40-49	50-59	60-69	≥70	
Type I, n (%)	9 (5-1)	28 (8-5)	36 (14-3)	33 (14-6)	29 (15-7)	19 (17-1)	154 (12)
Type II, n (%)	1 (0-6)	12 (3-6)	11 (4-4)	17 (7-5)	26 (14-1)	18 (16-2)	85 (6-6)
Type III, n (%)	0	0	0	2 (0-9)	3 (1-6)	3 (2-7)	8 (0-6)
Total, n (%)	10 (5-6)	40 (12-1)	47 (18-7)	52 (23)	58 (31-4)	40 (36)	247 (19-3)
Total no	177	331	252	226	185	111	1282



**Figure-2:** Prevalence of androgenetic alopecia in women. Comparison with the results of three previous studies.

while the least common was type III in 8(3.2%).

## Discussion

AGA is a hair-loss resulting in certain patterns in response to androgens in circulation in individuals with genetic tendency.<sup>1</sup> Although many hormones may have an effect on hair growth, but androgens appear to be more effective than the rest.<sup>10</sup> However, it is also known that different responses are received to androgen hormone among the follicles.<sup>11</sup> As a result, hair-loss patterns with different characteristics are observed according to the rate of to be affected of the hair follicles in different regions of the scalp.

Studies on hair-loss pattern and the prevalence of AGA were conducted by many researchers in different regions.<sup>3-5,7-9</sup> Researches have shown that; there were significant proportional differences in both hair-loss pattern and the prevalence of AGA.<sup>3-5,7-9</sup> A study conducted in China reported different ratios in various cities.<sup>9</sup> A study on Caucasians found AGA prevalence to be 30%, 40% and 50% in 30s, 40s, 50s years of age respectively.<sup>5</sup> Although there are several variations in studies conducted in various countries on Caucasians, but similar results have been reported.<sup>12-16</sup> In a study conducted in UK, the female pattern AGA was observed in 6% women under the age of 50, 38% over the age of 70.<sup>13</sup> In a study in Australia on individuals over age 20, AGA prevalence was found to be 44.9% in men and 32.2% in women.<sup>16</sup> On the other hand, in studies conducted in Asia, AGA prevalence was found to be quite low in both men and women.<sup>7-9</sup> In a study conducted in China, AGA prevalence was 21.3% in men and 6% in women.<sup>9</sup> In another study conducted in Shanghai, the results were found to be similar in men, but lower in women (19.9% men, 3.1% women).<sup>8</sup> In a Korean study, AGA prevalence was identified as 14.1% in men and

5.6% in women.<sup>7</sup> Similarly, in a study conducted in Africa, similar results were obtained with the results of Asian studies (14.6% men, 3.5% women).<sup>17</sup> The results as such reveal that there are regional proportional differences in the prevalence of AGA.

We determined the prevalence of AGA in the North Anatolian region and the results obtained were compared with previous studies (Figures-1 and 2). The classification method and age groups of the studies that we chose for comparison were similar to our study. Our study revealed that the prevalence of AGA in males was significantly higher than Asians and Africans and similar to Caucasians (Our result: 47.5%; Australia 44.9%; Norwood 45.1%).<sup>3,16</sup> In our study, AGA prevalence in women was higher than the results of Asia and Africa, like in men (China 6%; Shanghai 3.1%; Korea 5.6%; African 3.5%).<sup>7-9,17</sup> In this study, the prevalence of AGA in women was similar to the results of Norwood's study (our result: 19.3%; Norwood 19%).<sup>4</sup> As a result, in our study, the prevalence of AGA was found to be higher than the results of studies conducted in Asia and Africa. On the other hand, the data we obtained was found to be similar with the results obtained in the studies on Caucasians. When we look separately for both genders, the results were found to be similar.

There are regional differences in the hair-loss pattern as well as the prevalence of AGA. In general, while the vertex pattern hair-loss is at the forefront in the studies conducted in the Asian region, frontal pattern hair-loss is observed more frequently in the studies on Caucasians.<sup>5,7,8,15</sup> Grade III vertex type was the most common in studies of Korea and Shanghai, grade IV has found to be the most common type in Chinese studies.<sup>7-9</sup> In this study, the most common type in men was different from the Asian region was grade VI, the least common type was grade III vertex. Mixed pattern (frontal and vertex hair-loss) hair-loss has been identified as the most common pattern. Frontal pattern hair-loss was observed more frequently than the vertex type. In most of the studies on Caucasians, female pattern hair-loss has not been included. Also, female pattern hair-loss has not been included in Hamilton and Norwood classifications.<sup>3,5</sup> However, female pattern hair-loss in men has been found in a high proportion in many studies particularly conducted in Asia (3.7% China, 11.1% Korea).<sup>7,9</sup> In this study, female pattern hair-loss in men has been identified as much lower than the results of the study conducted in Asia (0.2%). When AGA was analysed in women, similar to many studies, the most common pattern was found to be as Ludwig grade I, and the least common pattern was Ludwig grade III.<sup>7-9</sup> In Asian studies, male pattern hair-loss in women was observed at lower rates.<sup>8,9</sup> In this study,

male pattern hair-loss in women was not observed.

The study is the first community-based epidemiological study conducted on the prevalence and pattern of AGA in Turkey. However, one of the limitations of this study is that it was conducted in only a specific region, not including the entire country. Besides, trichoscopy is recently used as a valuable diagnostic method to reveal the different diagnosis of hair-loss. The pathological changes seen in the AGA can be better laid out with trichoscopy (the hair shaft diameter, the percentage of fine hairs, the evaluation of the hair follicle unit etc.). Our study only used dermatological examination and not trichoscopy which was another limitation.

### Conclusion

The prevalence of AGA in both genders in Turkey was higher than in Asians and Africans, and similar to Caucasians.

### Acknowledgments

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