

A Retrospective Study on the Characteristics of Androgenetic Alopecia among Asian Races in the National Skin Centre, a Tertiary Dermatological Referral Centre in Singapore

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Abstract

Objective: To study the characteristics and psychosocial impact of androgenetic alopecia among Asian races. **Methodology:** A retrospective telephone interview study of patients managed for androgenetic alopecia in 1997 in a tertiary dermatological referral centre in Singapore. **Results:** Two hundred and fifty-six patients (111 females and 145 males) were included in the study. Their mean age at presentation was 33.7 years. There were no significant statistical mean age differences among the different races (Chinese, Malay and Indian). The mean duration of disease before consultation was 31.2 months; 33.2 months for males and 28.9 months for females (ns). Almost all patients (96.4%) were socially embarrassed and “unhappy” about their androgenetic alopecia. Most (90.5%) sought treatment for “cosmetic” reason. Slightly more males sought treatment for cosmetic reason than female ($P = 0.01$). 7.5% were worried about an underlying systemic disease as a cause of their alopecia. A positive family history of androgenetic alopecia was recorded in 58.9% (151/256). Male patients tend to have higher proportion of having a father or male sibling with similar problem, whereas female patients tend to have higher proportion of having a mother or female sibling with androgenetic alopecia. The predominant balding patterns for males were a combination of frontal, bi-temporal recession and vertex thinning (43%, 45% and 55%, respectively). Whereas in females, the predominant presentation was vertex thinning (60%) and, infrequently, frontal and bi-temporal thinning (19% and 15%, respectively). Diffuse pattern was also more predominant in females (28%) compared to males (10%). **Conclusions:** Most patients presented in their thirties with females presenting earlier than males and almost all patients presented for treatment for cosmetic reasons. Patients are generally unhappy about their appearance as a result of their alopecia. A strong positive family history appears to suggest that the disorder may be acquired through an autosomal dominant trait. Male patients tend to have a father or male sibling with similar condition and female patients tend to have a mother or female sibling with similar condition.

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Introduction

Androgenetic alopecia is hair thinning or balding due to the influence of androgens in males and females. Androgenetic alopecia is reported to affect 50% of the population by the age of 50 years in males and a decade later in females.^{1,2}

Androgenetic alopecia is a common reason for a dermatological consultation in many dermatology skin clinics. There is no diagnostic test to confirm androgenetic alopecia. Diagnosis is based on clinical characteristics and after excluding other causes of alopecia. The availability of drugs, in particular topical minoxidil over the last decade and recently, finasteride, for treating androgenetic alopecia has resulted in more patients seeking treatment. Androgenetic alopecia has a striking psychosocial impact on many men and women.

This is a retrospective study of patients with androgenetic

alopecia presenting in a tertiary dermatological referral centre in Singapore. The objective of this paper was to study the characteristics of the disorder and its psychosocial impact on patients.

Materials and Method

This is a retrospective study on the epidemiology of patients with androgenetic alopecia in patients attending the National Skin Centre (NSC), a tertiary dermatological referral centre in Singapore.

All patients clinically diagnosed to have androgenetic alopecia in 1997 were included in the study. Androgenetic alopecia was diagnosed based on clinical history, characteristic clinical features and after the exclusion of other causes of alopecia (clinically and after laboratory tests). The classical presentation includes a receding fronto-parietal hairline (M pattern) or thinning of scalp hair over

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the vertex and fronto-temporal areas of the scalp or both with no other obvious systemic cause or evidence of local scalp disorders.

The pattern of hair loss was classified according to the region of the scalp with obvious hair loss. We have introduced a description which is slightly different from the Hamilton Norwood and the Ludwig classification. Generally, hair loss in androgenetic alopecia is observed in the following areas of the scalp viz.

- mid frontal,
- bi-temporal (with intact frontal hair—"M" pattern),
- fronto-parietal (a receding frontal and bi-temporal hair line),
- vertex, and
- diffused.

Most patients with androgenetic alopecia have a combination of one or more affected areas. We had classified patterns of androgenetic alopecia according to areas of the scalp as against specific patterns as described by Hamilton and Norwood's classification.

The demographic data of all patients diagnosed to have androgenetic alopecia were collated, including their age, sex, race, duration of disease, age at onset and occupation (unemployed, professionals, clerical workers, technicians and associate professionals, production craftsmen, operators, cleaners and labourers, housewife, students and others).

A crude measurement of the psychosocial impact of their alopecia was recorded as follows:

- acceptable—would not seek cosmetic treatment,
- unhappy—would seek cosmetic treatment, but would not try to hide alopecia and would not spend more than \$50 per month on treatment,
- very unhappy—would try to hide alopecia, would actively seek cosmetic treatment at all cost.

This measurement has not been validated and was used as a crude measure to ascertain the degree of unhappiness.

Where information was not available, patients were contacted by telephone to collect the missing information.

The demographic characteristics were collated and analysed. Statistical analysis was carried out with the chi-square test, Fisher's exact test and Student's *t*-test where relevant. *P* values of <0.05 were considered statistically significant.

Results

Two hundred fifty-six patients (111 females and 145 males) were diagnosed to have androgenetic alopecia clinically in the NSC in 1997. This represented 0.4% (256/64,423) of new patients seen. The mean age at presentation was 33.7 years (range, 17 to 62 years). The mean age for males and females were 36.9 years (range, 17 to 42 years) and 31.5 years (range, 17 to 62 years), respectively (ns).

Compared to the racial distribution of the Singapore population (Chinese, 75%; Malay, 15%; Indian, 7%; Others, 3%), the Malays were underrepresented. The number of Malay patients in the study was small. There were no significant statistical differences in the mean ages among the different races and the proportion among difference races compared to the Singapore population in patients with androgenetic alopecia (Table I).

Fifty-eight (22.7%) were professional workers, followed by technicians & associate professionals (11.3%) and housewives (8.6%) (Table II).

The mean duration of disease before consultation was 31.2 months (range, 1 to 160 months). The mean duration was 33.2 months (range, 1 to 160 months) for males and

TABLE I: DISTRIBUTION ACCORDING TO RACE AND SEX

	Mean age (y)	SD (y)	No. (%)
Chinese	34.0	10.1	219 (89.0)
Male	31.6	8.4	127
Female	47.4	11.3	92
Malay	32.0	6.3	4 (1.6)
Male	29.3	4.0	3
Female	40.0	0	1
Indian	30.6	7.2	20 (8.1)
Male	30.6	7.4	14
Female	30.5	7.2	6
Total	33.7	9.9	246*
Male	36.9	11.1	145
Female	31.5	8.2	101

SD: standard deviation

* 10 missing race entries

There was no significant statistical difference among the mean age of presentation among the difference races and between the sexes.

TABLE II: FREQUENCY ACCORDING TO SEX AND OCCUPATION

Occupation	Male No. (%)	Female No. (%)	Total No. (%)
Professional	40 (27.6)	18 (16.2)	58 (22.7)
Clerical workers	1 (0.4)	4 (3.6)	5 (2.0)
Technicians & associate professionals	10 (6.9)	19 (17.1)	29 (11.3)
Production craftsmen, operators, cleaners labourers	13 (9.0)	4 (3.6)	17 (6.6)
Others (Housewife)	0 (0.0)	22 (19.8)	22 (8.6)
Others (Student)	14 (9.7)	5 (4.5)	19 (7.4)
Others (Unemployed)	67 (46.2)	39 (35.1)	106 (41.4)
Total	145	111	256

There was no significant statistical difference in the proportions of occupation type between the sexes except that "housewife" was significantly prevalent in the female group.

TABLE III: PSYCHOLOGICAL IMPACT OF ANDROGENETIC ALOPECIA ACCORDING TO GENDER

	Male		Female		Total	
	No.	(%)	No.	(%)	No.	(%)
Acceptable	1	(1)	0		1	(0.6)
Unhappy	94	(95.0)	68	(98.6)	162	(96.4)
Very unhappy	4	(4.0)	1	(1.4)	5	(3.0)
Total	99		69		168	

There was no significant statistical difference on the severity of impact between the sexes.

28.9 months (range, 3 to 99 months) for females (ns).

Androgenetic alopecia caused unhappiness in 162 cases (96.4%) and the percentage was slightly higher in female patients (98.6%). The differences in proportions of those who were unhappy between the sexes were not statistically significant (Table III). Most of the patients (90.5%) sought treatment because of "cosmetic appearance". The proportion was significantly higher in males than females ($\chi^2 = 6.1$, $P = 0.01$). Fifteen (7.5%) patients were worried about an underlying disease as a cause of their alopecia and sought treatment. The rate was slightly higher for females than males (ns).

A family history (one or more parents and siblings) of androgenetic alopecia was recorded in 58.9% (151/256); a positive family history was present in 56% of males compared to 66% of females (ns). Male patients tended to have higher proportion of having a father or male sibling with similar problem, whereas female patients tended to have higher proportion of having a mother or females

sibling with androgenetic alopecia (Table IV).

In males, the predominant patterns of balding were a combination of frontal, bi-temporal recession and vertex thinning (43%, 45% and 55%, respectively), whereas in females, the predominant presentation was vertex thinning (60%) and, infrequently, frontal and bi-temporal thinning (19% and 15%, respectively). Diffuse pattern was also more predominant in females (28%) compared to males (10%) (Table V).

Discussion

Androgenetic alopecia is the commonest hair loss disorder among patients seeking hair loss treatment in dermatological clinics in most countries. Hamilton² reported that 96% of men and 79% of women will develop a natural progression of androgenetic alopecia after puberty. In our study, androgenetic alopecia represented 0.4% of new patients seen in the NSC. The exact prevalence of androgenetic alopecia in Singapore is unknown. Many affected individuals probably accept it as a cosmetic problem which is associated with ageing. Many probably sought treatment from "trichologists" and beauticians. The mean age at presentation of male and female patients who suffered from androgenetic alopecia was 37 years and 32 years, respectively. Male patients tend to present later (3 years) than female patients (2 years) do probably because hair thinning is cosmetically less acceptable to females than males. The mean duration of androgenetic alopecia before seeking treatment was longer in males than females in our cohort.

Hamilton and Norwood classified male pattern alopecia into type I-VIII, including bi-temporal recession to frontal

TABLE IV: PROPORTION WITH POSITIVE FAMILY HISTORY ACCORDING TO GENDER

	Male		<i>P</i> values	Female		Total	
Family history	No.	(%)		No.	(%)	No.	(%)
Father only	42	(29.0)	$\chi^2 = 15.2$, $P = 0.0001$	20	(19.8)	62	(25.2)
Mother only	10	(7.0)	$\chi^2 = 21.3$, $P = 0.0000$	16	(15.8)	26	(10.6)
Father/Mother	2	(1.4)	$\chi^2 = 14.6$, $P = 0.0001$	5	(5.0)	7	(2.8)
Male sibling	29	(20.0)	ns	14	(13.9)	43	(17.5)
Female sibling	1	(0.7)	$\chi^2 = 11.3$, $P = 0.0008$	12	(11.9)	13	(5.3)

TABLE V: PRESENTATION PATTERN OF ANDROGENETIC ALOPECIA (PATIENTS MAY HAVE MORE THAN ONE PATTERN)

	Male		<i>P</i> values	Female		Total	
Pattern	No.	(%)		No.	(%)	No.	(%)
Frontal	63	(43.4)	ns	19	(18.8)	82	(33.3)
Bi-temporal	65	(44.8)	$\chi^2 = 4.1$, $P = 0.04$	16	(15.8)	81	(32.9)
Frontal-parietal	30	(20.7)	ns	3	(3.0)	33	(13.4)
Vertex	79	(54.5)	ns	61	(60.4)	140	(56.9)
Diffuse	15	(10.3)	$P = 0.0001^*$	28	(27.7)	43	(17.5)

* Fisher's exact test

and/or vertex thinning with the retention of hair along the occipital and temporal margin. Hamilton³ and Norwood⁴ observed that 58% of men aged over 50 years had type V to VIII and the extent of male pattern hair loss increases with age. Among our male patients, vertex thinning (54.5%) was the most common pattern, followed by bi-temporal recession (44.8%) and frontal recession (43.4%). We found that it was not possible to strictly follow the Hamilton Norwood or Ludwig classifications of androgenetic alopecia in our patients because some patients had various combinations of regional hair loss which did not fit in to the classical classification. For example, a patient with diffuse or vertex hair thinning may have bi-temporal or frontal balding. We also saw patients with receding frontal and parietal hairline but with intact vertex hair.

The pattern of hair fall was significantly different between male and female patients. In our study, while male patients tended to have frontal, bi-temporal, fronto-parietal recession and vertex thinning, female patients tended to have a predominantly vertex thinning (60%).

The Ludwig female pattern alopecia is classified into Ludwig pattern I-III, where the thinning of hair involves mainly the vertex leaving the frontal hairline intact. Ludwig⁵ also described true male pattern alopecia with fronto-parietal recession that rarely occurs in females. In our study, the commonest pattern for the female patients was vertex thinning (60.4%) followed by diffuse thinning (27.7%).

Venning and Dawber⁶ reported that androgenetic alopecia occurred in varying degree for 100% of 564 women over 20 years of age. They also found 87% of pre-menopausal women had Ludwig pattern I-III and 13% had Hamilton type II-IV. Venning and Dawber⁶ reported that 63% of post-menopausal women had Ludwig pattern I-III and 37% had Hamilton type II-IV. It would appear that post-menopausal women tend to have Hamilton Norwood type of hair loss. The mean age of female patients in our study was 30 years; hence, the frontal and bi-temporal recession patterns commonly seen in males were uncommon in females.

Hamilton² proposed that the causes of androgenetic alopecia are due to the effects of androgens and genetic factors. The current understanding is that dehydrotestosterone is the main hormone responsible for androgenetic alopecia. The conversion of testosterone to dehydrotestosterone requires the enzyme 5 α -reductase II. The dehydrotestosterone is responsible for the miniaturisation of the hair follicles on the scalp.^{7,8}

Genetic factor appears to be an important factor in the acquisition of androgenetic alopecia. In our study, more than 60% of our patients had positive family history of androgenetic alopecia. Kluster and Happle⁹ proposed that

androgenetic alopecia is inherited as a polygenetic trait. They considered that the risk of developing androgenetic alopecia increases in proportion to the number of affected family members. Androgenetic alopecia has also been postulated to be an autosomal dominant disorder.¹⁰

Many patients with androgenetic alopecia are distressed by this problem. Many struggled to cope with the resultant distress. Almost all our patients were unhappy with their alopecia and hence have sought treatment in our centre. This is not unexpected as our patients consist of a selected cohort of alopecia patients who are motivated to come forward for treatment. Many patients worry that their androgenetic alopecia and their physical acceptability will worsen. They search for ways to halt or reverse the course of their condition and to restore their body-image integrity, sometimes at great costs.^{11,12}

Several reports on the psychosocial effects of androgenetic alopecia indicated that the condition engendered considerable anxious preoccupation, helplessness, and feelings of diminished attractiveness in those affected with the disorder.¹¹⁻¹⁴

Men and women perceive visibly balding men as older and less physically and socially attractive than their non-balding peers. In one report, more than one fourth of the men conveyed that their hair loss was extremely upsetting. An additional 62% expressed modest to moderate emotional distress.¹³ In our study, 94% of males were unhappy about their androgenetic alopecia.

The psychosocial impact of androgenetic alopecia has been reported to be more severe for women than for men.^{13,14} In an earlier report, twice as many females, compared to males, expressed that they were either “very” or “extremely upset” by their hair loss. Women also reported significantly more negative psychosocial effects such as social inadequacy, psychological maladjustment, rigidity, low self-esteem, felt ashamed and less attractive and more coping efforts than men.¹²⁻¹⁴

Because of the severe negative psychosocial impact on some of the patients with androgenetic alopecia, dermatologists should try to attend to the needs of these patients, rather than dispense them off as “vain” individuals. The aim of treatment is to promote hair re-growth and to retard further thinning of the hair. For men with minimal to moderate hair loss, topical minoxidil 2% or 5% lotion and finasteride (inhibitor of type II 5 α -reductase) 1 mg daily are treatment options available, but treatment must be continued for at least 6 months to 1 year to assess their efficacy.¹⁵⁻²⁰ It is more difficult to treat female androgenetic alopecia. Female with androgenetic alopecia can be treated with topical minoxidil solution. Other treatment options include oral cyproterone acetate and low dose spironolactone, but they tend to produce side effects such as weight gain,

menstrual irregularity, fatigue and hyperkalaemia.²¹ High-dose cimetidine 300 mg 5 times daily for 1 to 9 months has been reported to produce hair growth in females.²²

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