A Cross Sectional Study of Hair Line Recession, Severity and Trichoscopy Features of Androgenetic Alopecia in Nigerian Males

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Background: Androgenetic alopecia is the commonest type of non-scarring hair loss in males, and it affects the quality of life in some individuals. This study aimed to determine the prevalence of male androgenetic alopecia, its severity, degree of hairline recession and trichoscopic features.

Methodology: This was part of a cross-sectional descriptive study of hair loss conducted in February 2020 amongst 100 male adult traders at an urban market (Lagos Island) in Lagos, Nigeria. Clinical findings, sociodemographic data and trichoscopic features were documented using a pre-designed study questionnaire. The severity of androgenetic alopecia was graded using the Hamilton–Norwood and Norwood scales. The IBM statistics software version 22 was used for data analysis.

Results: The prevalence of male androgenetic alopecia was 49% (49/100) and this prevalence increased with age. Median age (IQR) and age at onset were respectively 47 (IQR 40, 53) and 30-49 years. Severity based on Hamilton-Norwood scales increased with age. Hairline recession was absent in the younger age groups. Trichoscopy features included white dots with regular distribution (98%), reduced hair density (95.9%), preserved honeycomb pigment (95.9%), variable hair diameter (71.4%) and thin hair (49.0%).

Conclusion: Male androgenetic alopecia is common, and its severity increases with age. There are typical trichoscopic features associated with male androgenetic alopecia.

Keywords: Male androgenetic alopecia, Hairline recession, Trichoscopy

Une Étude Transversale de la Récession Capillaire, de la Gravité et des Caractéristiques de Trichoscopie de Alopécie Androgénétique Chez les Hommes Nigérians

ABSTRAIT

Contexte: L' alopécie androgénétique est le type le plus courant de perte de cheveux non cicatricielle chez les hommes et elle affecte la qualité de vie de certaines personnes. Cette étude visait à déterminer la prévalence de l'alopécie androgénétique masculine, sa gravité, le degré de récession capillaire et les caractéristiques de la trichoscopie.

Méthodologie: Cela faisait partie d'une étude descriptive transversale de la perte de cheveux menée en février 2020 auprès de 100 commerçants adultes de sexe masculin sur un marché urbain (île de Lagos) à Lagos, au Nigeria. Les résultats cliniques, les données sociodémographiques et les caractéristiques de la trichoscopie ont été documentés à l'aide d'un questionnaire d'étude préconçu. La gravité de l'alopécie androgénétique a été évaluée à l'aide des échelles Hamilton-Norwood et Norwood. Le logiciel de statistiques IBM version 22 a été utilisé pour l'analyse des données.

Résultats: La prévalence de l'alopécie androgénétique masculine était de 49 % (49/100) et cette prévalence augmentait avec l'âge. L'âge médian (IQR) et l'âge de début étaient respectivement de 47 ans (IQR 40, 53) et 30-49 ans. La gravité basée sur les échelles de Hamilton-Norwood augmentait avec l'âge. La récession capillaire était absente dans les groupes d'âge plus jeunes. Les caractéristiques de la trichoscopie comprenaient des points blancs

avec une distribution régulière (98 %), une densité de cheveux réduite (95,9 %), un pigment en nid d'abeille préservé (95,9 %), un diamètre de cheveux variable (71,4 %) et des cheveux fins (49,0 %).

Conclusion: L'alopécie androgénétique masculine est fréquente et sa sévérité augmente avec l'âge. Il existe des caractéristiques de trichoscopie typiques associées à l'alopécie androgénétique masculine.

Mots-clés: Alopécie androgénétique masculine, Récession capillaire, Trichoscopie

Introduction

Androgenetic alopecia is the commonest type of non-scarring hair loss in males.[1-3] It affects the quality of life of quite a number of individuals who have the condition but treatment is sought in only some of them.[4] The effect on quality of life is compounded by hairline recession which negatively affects the perception of how old an individual is thought to be.[5] Androgenetic alopecia (AGA) although reported to be an androgen-driven process is associated with a polygenic inheritance (varied loci) and influenced by environmental factors.[6-8] Clinically, it is characterized by progressive hair loss with reduced hair length, pigmentation and progressive hair thinning.[2,7,8] In men, the hair loss is bitemporal, at the vertex and frontal scalp or there could be complete vertex hair loss with residual temporal and occipital hair.[2,7,9]

The prevalence of male androgenetic alopecia varies between 6.9 and 72.8% in different countries and prevalence increases with age being more common in middle-aged and elderly individuals.[1,10-12] Prevalence is documented to be 9.4 to 17% in those aged 20-29 years and over 70% in those aged 70 years and above.[1,3,11]

Several validated scales have been developed for evaluating the severity of MAGA and the degree of hairline recession.[13] These scales are depicted in a pictorial form thus making it objective and easy to grade the severity of MAGA.[12] Another method used in the evaluation of MAGA is the BAsic and SPecific (BASP) classification systems.[12,14] The BAsic classification evaluates the pattern of hair loss, while the SPecific classification evaluates the area of hair loss.[12,14]

Trichoscopy, a non-invasive examination is commonly deployed in the assessment of MAGA.[15-17] Typical trichoscopic features of MAGA include variable hair diameter, thin hair in the frontal area, single hair, vellus hair, brown peripilar sign and honeycomb pigment.[15-17] Late-stage features include loss of follicular opening, increase in the number of white dots, white peripilar pigments in areas with absent hair and yellow dots.[17]

Androgenetic alopecia occurs in Nigeria like in other countries. There are, however, few documented studies on the prevalence of MAGA in Nigeria. Furthermore, published data on its severity, staging and trichoscopy features are few. The documentation of trichoscopic features will aid early diagnosis and prompt management of patients especially because of its non-invasiveness and it is not expensive for patients who pay out of pocket for their investigations and cannot afford a biopsy and histology. The aim of this study, therefore, is to determine the prevalence of MAGA and document its severity, degree of hairline recession and trichoscopic features among Nigerians.

Methodology

This was part of a cross-sectional descriptive study of hair loss conducted on the 27th of February 2020 amongst 100 male adult traders at an urban market (Lagos Island) in Lagos, Nigeria. Ethical approval was sought for and was granted by the health research and ethics committee of the Lagos State University Teaching Hospital (LREC/06/10/1297). Permission was also sought from and granted by the trader's union president. Written consent was also obtained from the traders. All consecutive consenting male adult traders were recruited and documented using a questionnaire designed for the study.

The data obtained included sociodemographic data, history of hair loss, duration of hair loss, family history of hair loss. All participants were clinically evaluated by 6 board-certified dermatologists (following 2 months of meetings and agreement on clinical and trichoscopy features) and the diagnosis of hair loss was clinical. The pre-designed questionnaire had a pictorial representation of this scale for uniform and easy documentation by the

investigators. Any male with a receding temporal hairline or hair loss at the vertex or front of the scalp with or without the involvement of the crown was deemed to have MAGA. In individuals identified to have MAGA, its severity was graded using 2 pictorial instruments; the Hamilton–Norwood scale[13] for MAGA staging and Norwood scale for temporal hairline recession.[13] Figures 2 and 3.

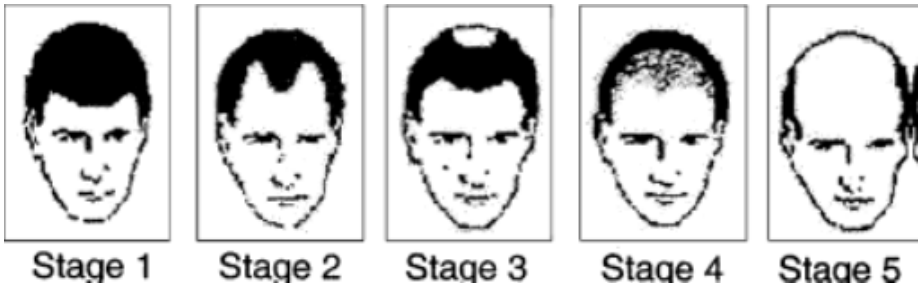

Figure 1. Hamilton–Norwood scale for male pattern baldness.[13]

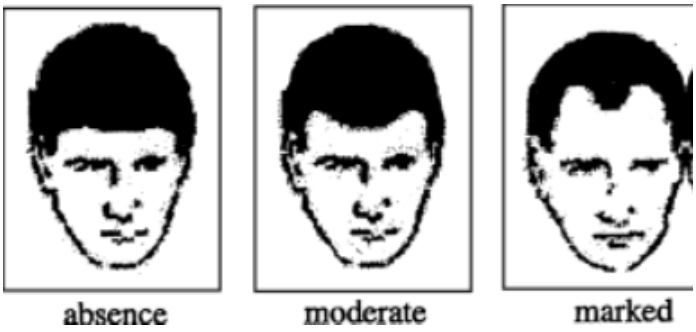

Figure 2. Temporal hair line recession.[13]

Trichoscopy features of MAGA were documented using the DermLite® DL 4 which has a x10 magnification (3 Gen, San Juan Capistrano, CA, USA) in the non-polarized mode. Before each participant's evaluation, the lens of the scope was cleaned with an alcohol wipe and immersion fluid was not used in the study. Each participant had 3 areas of the alopecic scalp examined; the hairline, the edge of the alopecic patch and the centre of the alopecic patch. Each dermatologist had a checklist (Appendix 1) of different trichoscopic features of androgenetic alopecia. This checklist had well-identified trichoscopic features previously reported by several authors.[15,17] Findings were documented with the study questionnaire. Photographs of consenting participants were taken by one dermatologist using the iPhone pro phone camera in white light. Pictures were transferred to and stored in a computer hard drive.

Statistical Analysis

The Kolmogorov-Smirnov test was used to assess the normality of outcome numerical variables. The median and interquartile range were used to present numerical variables that were not normally distributed. The frequency distribution of numeric and categorical variables is presented as percentages. Kruskal Wallis test was used to compare the median of more than two categorical groups and significance was set at 5%. The IBM statistics software version 22 was used for data analysis.

Results

The prevalence of MAGA was 49% (49/100) and the median age of the participants was 47 (IQR 40, 53) years. A family history of hair loss was reported in 11 participants and this was in first degree relations in 9 participants, uncle in 1 and cousin in 1. (Table 1) The duration of hair loss was not known in 69.4% (34/49) of the males and in those who knew the median duration was 9 (5, 21) years. The age at onset of hair loss was not known in 37 (75.5%) of the men and there was no onset of hair loss after age 50 years. The severity of MAGA based on the Hamilton-Norwood scale is as displayed in table 2 with stage 5 more in those aged $\geqslant$ 60 years. The proportion of those with absent hair line recession was higher in participants aged less than 29 years and hair line recession was marked above age 60 years of age. (Figure 3 and Table 3) Age was found to significantly be associated with hair line recession but not with increased severity of Hamilton-Norwood stage. (Table 5)

The main trichoscopy features were reduced hair density, white dots with regular distribution, white dots, preserved honeycomb pigment network, variable diameter (decrease in the diameter of hair

observed in more than 20% of the hair). Late signs were identified in some individuals; loss of follicular opening and absent vellus hair in front. Other features identified in 2 participants were: disrupted honeycomb pigment network, brown pigment, peripilar scaling, yellow dots, white dots with irregular distribution and peripilar sign. Table 5 and figures 4 A & B

TABLE 1: Sociodemographic and Historical Data

Variable	Frequency	Percentage
Age group (years)		
< 30	3	6.1
30 – 39	8	16.3
40 – 49	19	38.8
50 – 59	12	24.5
⩾60	7	14.3
Median (IQR)	47 (40, 53)	
Age at onset of hair loss (years) n=12		
<30	2	16.7
30-49	10	83.3
>50	0	0.0
Complained of hair loss		
Yes	12	24.5
No	37	75.5
Family history of hair loss		
Yes	11	22.4
No	21	42.9
I don't know	17	34.7
History of hair loss in first degree relations n = 9		
Father	6	66.7
Brother	2	22.2
Mother	1	11.1
Sister	0	0.0
Duration of hair loss n=15		
< 1 year	0	0.0
1 – 4 years	2	13.3
5 – 9 years	6	40.0
⩾10 years	7	46.7
Median (IQR)	9 (5,21)	

Table 2: Age Distribution Of Male Androgenetic Alopecia Using Hamilton-Norwood's Scale

Age(years)	Stage 1 n = 11 (%)	Stage 2 n = 13 (%)	Stage 3 n = 9 (%)	Stage 4 n = 12 (%)	Stage 5 n = 4 (%)	Stages 3-5 n=25 (%)
< 25	0 (0.0)	1 (7.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
25 – 29	1 (9.1)	1 (7.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
30 – 34	1 (9.1)	0 (0.0)	1 (11.1)	0 (0.0)	0 (0.0)	1 (4.0)
35 – 39	2 (18.2)	3 (23.1)	1 (11.1)	0 (0.0)	0 (0.0)	1 (4.0)
40 – 44	1 (9.1)	3 (23.1)	2 (22.2)	3 (25.0)	0 (0.0)	5 (20.0)
45 – 49	3 (27.3)	1 (7.7)	3 (33.3)	2 (16.7)	1 (25.0)	6 (24.0)
50 – 54	2 (18.2)	1 (7.7)	0 (0.0)	5 (41.7)	0 (0.0)	5 (20.0)
55 – 59	0 (0.0)	1 (7.7)	1 (11.1)	2 (16.7)	0 (0.0)	3 (12.0)
≥ 60	1 (9.1)	2 (15.4)	1 (11.1)	0 (0.0)	3 (75.0)	4 (16.0)

Table 3: Hair Line Recession

Age (years)	Absent	Moderate	Marked
	n = 4	*n = 24 (%)*	*n = 21 (%)*
< 25	0 (0.0)	0 (0.0)	1 (4.8)
25 – 29	0 (0.0)	2 (8.3)	0 (0.0)
30 – 34	1 (25.0)	1 (4.2)	0 (0.0)
35 – 39	1 (25.0)	5 (20.8)	0 (0.0)
40 – 44	0 (0.0)	6 (25.0)	3 (14.3)
45 – 49	2 (50.0)	3 (12.5)	5 (23.8)
50 – 54	0 (0.0)	3 (12.5)	5 (23.8)
55 – 59	0 (0.0)	2 (8.3)	2 (9.5)
⩾60	0 (0.0)	2 (8.3)	5 (23.8)

Table 4: Association of Hamilton Scale and Hair Line Recession with Age

Variable	n = 49	Median age (IQR)	p
Hamilton-Norwood Stage			
Stage 1	11	45 (35, 50)	0.057
Stage 2	13	44 (35, 53)	
Stage 3	9	45 (39, 51)	
Stage 4	12	51 (51, 53)	
Stage 5	4	63 (51, 72)	
Hair recession			
Absent	4	41 (34, 47)	0.022
Moderate	24	44 (36, 51)	
Marked	21	52 (46, 59)	

Table 5: Trichoscopy Features

Trichoscopic findings	Frequency	Percentage
White dots	49	100.0
White dots regular distribution	48	98.0
Reduced hair density	47	95.9
Honeycomb pigment preserved	47	95.9
Variable diameter	35	71.4
Thin hair	24	49.0
Vellus hairs	18	36.7
Loss of follicular opening	10	20.4
Miniaturized hair	8	16.3
Varying hair length	8	16.3
Hypopigmented hair	6	12.2
Single hair	5	10.2
Absent vellus hair in front	4	8.2
Black dots	4	8.2
Peripilar cast	2	4.1
Yelow dots	2	4.1
Perihilar white grey halo	2	4.1
Whites pathes	2	4.1
Broken hair	1	2.0
Peripilar scaling	1	2.0
Clustered short regrowing	1	2.0
Peripilar sign	1	2.0

Discussion

Androgenetic alopecia is a common type of hair loss in males.[1,2] The prevalence of androgenetic alopecia in this study was low compared to what is reported in Caucasians and Asians[1,3,11,18] but higher than that reported in other epidemiological studies of hair loss in Africans.[10,19] Androgenetic alopecia appears to have a lower prevalence in Africans than in non-Africans.[10,19] The prevalence of androgenetic alopecia is reported to increase with age in consonance with this study as reported by other authors and to be up to 90% in individuals aged 90 years and above.[1,3,11] Most of the participants in this study did not regard their hair loss as a problem and so were unable to recall the age of onset of their MAGA. Amongst those who were able to, onset was at age 30-49 years and none after age 50 years. Salman et al in a study of androgenetic alopecia in Turkey reported a similar age of onset as in this study.[3] This is in keeping with androgenetic alopecia being a disease of older adults.[11,20]

Knowledge of a family history of hair loss was poor in most of the participants. In those who knew, the incidence was low and it was mostly in fathers. Ding et al following a similar study reported a family history higher than ours.[12] Although androgenetic alopecia has not been marked to any particular gene, it is reported to be commoner in individuals with a paternal history of MAGA.[12,14] Similar findings to our study were described by Lee et al, where MAGA was more marked in individuals with a paternal history.[14]

The severity of MAGA increased with age, stages 4 and 5 (Hamilton-Norwood) being seen mostly in males aged 45 years and above. Similar to our study, increasing chronological age and androgen levels have been identified as contributors to severe androgenetic alopecia.[1,2,10] Hairline recession, a method of grading MAGA was observed to be moderate and severe in an almost equal proportion of participants. Additionally, hairline recession was reduced in the young participants, but it is incidence increased with age and it was more marked in participants aged 55 years and above. In consonance with our study observation, hairline recession with increasing age was reported by Salman et al.[3]

The trichoscopy findings of reduced hair density, white dots with regular distribution, preserved honeycomb pigment network, variable diameter and thin hair are similar to what has been reported by others.[17,21] These features are consistent with the non-scarring nature of MAGA and the clinically observed features of reduced hair length, pigmentation and progressive thinning of hair.[7,8,21] In a few individuals, features consistent with severe disease; loss of follicular opening and absent vellus hair in front were identified. Androgenetic alopecia is a biphasic alopecia that is initially non-scarring and then becomes scarring at the late stage.[2,22] Our findings are similar to reports by researchers in India, Egypt, and China.[17,22]

Yellow dots a commonly reported late feature of androgenetic alopecia was observed in a few participants.[21,23] Yellow dots however are not readily identified on the pigmented scalp.[21,23] Single hairs from follicular opening a common feature of androgenetic alopecia was not readily identified in our study unlike in other reports of trichoscopy.[21-23] We are uncertain if this is because, over half of the participants in this study had early stages of androgenetic alopecia or if this is a racial feature.

This study was not without its limitations. The inability to objectively define the type of hair loss among the parents of the participants. Although the number of participants in the study is small, the fact that it is a cross-sectional community-based study is a strength.

In conclusion, our study supports what is already known; that MAGA is common in males and its severity increases with age. There are typical trichoscopy features associated with androgenetic alopecia.

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The authors declare no conflicts of interest.

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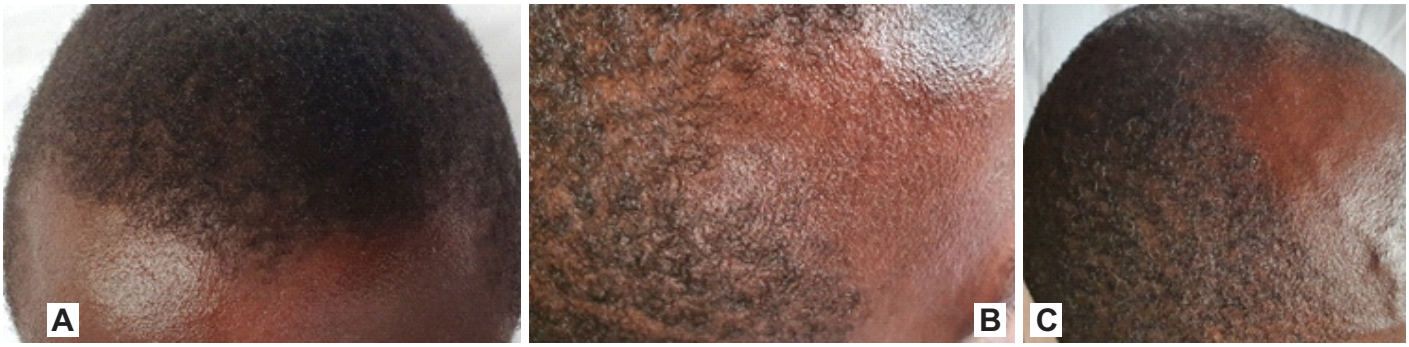
Figure 3. Degrees of hairline recession



A-Mild recession B-Moderate recession C-Severe recession

Figure 4A. Photograph of AGA

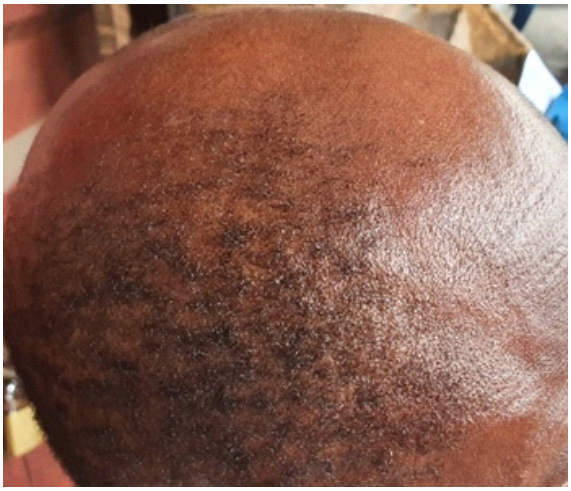
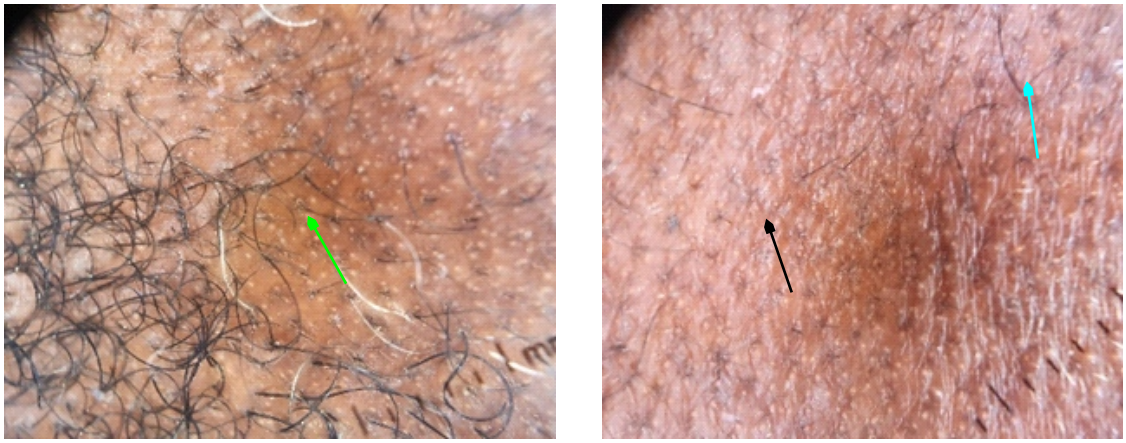


Figure 4B. Photograph of AGA and Trichoscopy



Black arrow-Honeycomb pigment Green arrow –White dots Blue arrow –Single hair

APPENDIX 1: CHECKLIST FOR TRICHOSCOPY FEATURES OF HAIRLOSS

TRICHOSCOPIC FINDINGS: White dots Present **Yes** **No**

Yellow dots	Black dots	Vellus hairs	Peripilar casts
Exclamation mark hairs	Thin hair	White dots with regular distribution	White dots (irregular distribution)
Knotted hair	Miniaturized hair	Single hairs	Arborizing red loops
Honeycomb pigment network preserved	Comma-shaped hairs	Honeycomb pigment network disrupted	Variable diameter
Peripilar erythema	Hypopigmented hair	Frayed hair	Red dots
Perihilar white/gray halo	Split ends	Reduced hair density	Blue-grey dots
Loss of follicular opening	White patches	Brown pigment	Perifollicular pustules
Pigmented asterisk-like hairs	Coiled hair	Broken hair	Peripilar scaling
Hair tufted hairs (.⩾6 hairs arising from a hair follicle)	Cadavarised hairs	Thick white interfolicular scales	Follicular plugging
Clustered short regrowing hair with normal thickness	Crust formation	Ingrown hair	Interfolliclar red loops
Cork-screw hairs	Scalp erythema	Varying hair length	Zigzag hairs
Absent vellus hairs in front	Broken hairs of different lengths	Peripilar sign	Scales