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TABLE OF CONTENTS

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ORIGINAL ARTICLE

Cross-Sectional Study of Trichoscopy Features, Prevalence, Types of Hair Loss and Hair Care Practices at a Lagos Urban Market

Étude Transversale des Caractéristiques de la Trichoscopie, de la Prévalence, des Types de Perte de Cheveux et des Pratiques de Soins Capillaires dans un Marché Urbain de Lagos

[1]*E. L. Anaba, [2]E. Otrofanowei, [2]A. O. Akinkugbe, [2]O. Ayanlowo, [3]O. M. Cole-Adeife, [3]I. R. Oaku, [4]I. Akwara

ABSTRACT

BACKGROUND: Hair loss studies have mostly been clinical with no trichoscopy features of the hair loss documented in Nigeria.

OBJECTIVE: The objective of this study was to determine the community prevalence, types of hair loss, trichoschopy features and the risk factors for the observed hair loss types.

METHODS: This was a cross-sectional descriptive study of traders (Fitz Patrick's skin types V–VI) at an urban market. The traders were clinically evaluated for hair loss. Sociodemographic, clinical and trichoscopy data were recorded using a study questionnaire. Data was analyzed using SPSS version 22.0. Statistics such as means, medians, frequencies, t-test and chi-square test were presented. Levels of significance of all tests was set at, P<0.05%.

RESULTS: A total of 307 participants (32.6% male and 67.4% female) with a mean age of 42.7±12.8 years were studied. The prevalence of hair loss was 68.7% (51% in males and 77.3% in females) and the mean age of those with hair loss was 44.8±12.3 years. The pattern of hair loss was patterned, diffuse and localized in 94.3%, 3.8% and 1.9% respectively. The main types of hair loss were androgenetic alopecia (26.9%) and traction alopecia (71.7%). The prevalent hair practices were; braids and weave-on (extensions) in 78.2%, turban-like head gear in 76.9%, and chemical relaxers in 73.8%. Trichoscopy features characteristic of the observed hair loss types were documented.

CONCLUSION: Hair loss is common in the community. The common hair care practices and increasing age could be contributors to hair loss. **WAJM 2022; 39(10): 1013–1021.**

Keywords: Trichoscopy, Hair loss, Hair care practice, Community, African, Prevalence.

RÉSUMÉ

CONTEXTE: Les études sur la perte de cheveux ont surtout été cliniques et aucune caractéristique trichoscopique de la perte de cheveux n'a été documentée au Nigeria.

OBJECTIF: L'objectif de cette étude était de déterminer la prévalence communautaire, les types de perte de cheveux, les caractéristiques de la trichoscopie et les facteurs de risque pour les types de perte de cheveux observés.

MÉTHODES: Il s'agissait d'une étude descriptive transversale de commerçants (types de peau V-VI de Fitz Patrick) sur un marché urbain. Les commerçants ont été évalués cliniquement pour la perte de cheveux. Les données sociodémographiques, cliniques et trichoscopiques ont été enregistrées à l'aide d'un questionnaire d'étude. Les données ont été analysées à l'aide de SPSS version 22.0. Des statistiques telles que les moyennes, les médianes, les fréquences, le test t et le test du chi-deux ont été présentées. Le niveau de signification de tous les tests a été fixé à P<0,05%.

RÉSULTATS: Un total de 307 participants (32,6% d'hommes et 67,4% de femmes) avec un âge moyen de 42,7±12,8 ans ont été étudiés. La prévalence de la perte de cheveux était de 68,7 % (51 % chez les hommes et 77,3 % chez les femmes) et l'âge moyen des personnes présentant une perte de cheveux était de 44,8±12,3 ans. La perte de cheveux était structurée, diffuse et localisée dans 94,3 %, 3,8 % et 1,9 % des cas respectivement. Les principaux types de perte de cheveux étaient l'alopécie androgénétique (26,9 %) et l'alopécie de traction (71,7 %). Les pratiques capillaires prédominantes étaient les suivantes : tresses et tissage (extensions) dans 78,2 % des cas, coiffure en turban dans 76,9 % des cas et défrisage chimique dans 73,8 % des cas. Les traits trichoscopiques caractéristiques des types de perte de cheveux observés ont été documentés.

CONCLUSION: La perte de cheveux est fréquente dans la communauté. Les pratiques courantes de soins capillaires et l'âge croissant pourraient contribuer à cette perte de cheveux. **WAJM 2022; 39(10): 1013–1021.**

Mots clés: Trichoscopie, Perte de cheveux, Pratique des soins capillaires, Communauté, Africaine, Prévalence.

[1]Department of Medicine, Faculty of Clinical Sciences, Lagos State University College of Medicine/Lagos State University Teaching Hospital, Lagos State, Nigeria. [2]Department of Medicine, Faculty of Clinical Sciences, College of Medicine, University of Lagos, Lagos State, Nigeria. [3]Department of Medicine, Lagos State University Teaching Hospital, Lagos, Lagos State, Nigeria. [4]Department of Medicine, General Hospital, Lagos, Lagos State, Nigeria.

***Correspondence:* Dr. L. Ehiaghe Anaba,** Department of Medicine, Faculty of Clinical Sciences, Lagos State University College of Medicine 1–5, Oba Akinjobi Way, Ikeja, Lagos State, Nigeria. Email: ehianaba@yahoo.com, Phone: +2348030495911.

INTRODUCTION

Hair loss occurs worldwide and it can be distressing for some affected individuals especially as this can have a negative impact on their quality of life.[1–3] Most of the studies on the prevalence of hair loss (HL) are hospital-based with few community studies.[4–8] The prevalence of HL in hospital based studies is 1.3–2% [4,5] and 11.8 to 40.03% in community-based studies.[7–10]

The most common type of hair loss is androgenetic alopecia (AGA) with a prevalence of 6.9 to 47.6%.[7,10–12] The documented prevalence of some of other HL types are; traction alopecia (TA) 7.7 to 79%,[6,7,13] alopecia areata (AA) 12.6 to 24%,[5,6,14] telogen effluvium (TE) 10.3 to 62.2%,[6,11,14] central centrifugal cicatricial alopecia (CCCA) 1.3 to 15.4%,[6,7,11,15,16] and acne keloidale 3.5 to 12.4%,[7,16]

Several hair care practices have been documented to be responsible for hair loss in women.[6,7,13,17,18] Community and hospital based studies on hair care practices reveal tight braiding, use of chemical relaxers, hot combs, weaving, weave-on, packing hair into a bun and infrequent hair shampooing to be the risk factors for hair loss.[6,7,13,17,18] Studies of hair care practice and hair loss show that chemical relaxers account for 53.3 to 69.2% of hair loss,[6,8,14,17] braids for 20.5%,[6] hair extensions for 23.1%[6] and local concoctions for 7.7%.[6] Nnoruka, *et al* and Khumalo, *et al* conclude that chemical relaxers, hair style, duration of hair care practice and attachment of extensions within 48 hours to chemically relaxed hair increases the risk of hair loss.[6,7]

Trichoscopy a non-invasive tool in the diagnosis of scalp and hair disorders is readily deployed and reported in Caucasians.[19–22] However, diagnostic trichoscopy features associated with different HL types is not commonly reported in Africans.[20,23,24]

In Nigeria, most studies of hair loss prevalence have been clinic based and in relation to the spectrum of dermatologic consultations. True community prevalence and evaluation of hair loss studies are few. Even fewer, are hair practice and trichoscopy evaluations. Thus far, there are only two studies of hair loss and the associated hair practice in Nigeria one of which was hospital based and conducted 14 years ago. None of these studies had trichoscopy evaluation of the documented hair loss types.[6,8]

The aim of this study was to determine the prevalence, types of hair loss, the risk factors (chemical relaxers, weaving, braiding, fixing of weave-on, hair extensions, prolonged use of turban-like scarves) and the trichoscopy features of hair loss in a group of traders in a selected market in Lagos, Nigeria.

METHODOLOGY

This was a cross-sectional descriptive study of 307 consenting adult traders at a designated market in Lagos, Nigeria. The study was conducted in February 2020 and all participants were Fitz Patrick's skin types V-VI. Ethical approval for the study was obtained from the ethics review board of the Lagos State University Teaching Hospital (LREC/06/10/1297) and permission to conduct the study was obtained from the market leaders. All consecutive adult traders who gave a written consent for the study, were documented using a study questionnaire. The questionnaire was pre-tested to assess for comprehension, ease of use and agreement of both clinical and trichoscopy terms by the involved dermatologists. Data documented include; sociodemographic parameters, family history of hair loss, duration of hair loss, hair care practices and duration of hair care practice. All the participants were clinically evaluated for hair loss, pattern and type of HL, hair style and trichoscopy examination was carried out by board certified dermatologists. Photographic documentation following written consent was done as required.

In this study, HL was noted as:

- Localized if one or two patches or confined to one area of the scalp.
- Diffuse if more than two patches or involved different scalp areas.
- Patterned if hair loss was marginal (traction alopecia) or resulted in central path widening in women (female androgenetic alopecia) or resulted in front hairline regression, frontal to vertex HL in men (male androgenic alopecia).

Trichoscopy examination was conducted using the DermLite® DL 4 (3 Gen, San Juan Capistrano, CA, USA) in a non-polarized mode. The dermoscope was cleaned with 70% alcohol wipes before each examination. Each participant was examined in a sitting position with good natural light. Trichoscopy findings were documented according to literature.[20,22,25–29]

Data analysis was done using SPSS version 22.0. Numerical variables are presented in percentages, means and standard deviation while nominal variables are presented as percentages. Student 't' test was used to compare the means of two independent groups while Chi squared test was used to compare the proportions of two independent groups. p value < 0.05 was considered significant.

RESULTS

A total of 307 participants with a mean age of 42.7±12.8 years were studied. The study participants were 32.6% male and 67.4% female. The prevalence of hair loss was 68.7% (211/307) and the mean age of those with HL was 44.8±12.3 years. The prevalence of hair loss was significantly more in females ($p<0.001$) with prevalence in males being 51% (51/100) and 77.7% in females (160/207). Hair loss increased with age being present in 5.7% of those <25years and in 22.8% of those ≥55 years. A family history of hair loss was recorded in 28.4% of participants and this was in 20%, 53.3%, 13.3% and 3.3% of fathers, mothers, sisters and brothers, respectively. The median duration of hair loss was 3 (IQR 1, 10) years and duration of hair loss was < 4 years in 36.5% and unknown in 34.1% of participants. Table 1.

Amongst the females, hair care practice is shown in Table 2. The most frequent hair style was a combination of chemically relaxed hair and braids, Figure 1. The duration of hair style was <5 years in 30.6%, 5–9 year in 14.4%, 10–14 years in 16.3%, ≥15 years in 36.3% and no response in 2.5%. The frequency of change of hair styles ranged from one week in 18.1% to ≥12 weeks in 5.7%. Chemical hair relaxer was used in 73.8% of the women and the interval between application of chemical hair relaxer and braiding/weaving varied from one day in 10.6% to >5 days in 33.1%. Also, frequency of hair wash ranged from daily

Table 1: Socio-Demographic Characteristics of Participants with Hair Loss

Variable	Frequency (n = 211)		Percentage (%)
Age group (years)			
< 25	12		5.7
25 – 34	28		13.3
35 – 44	68		32.3
45 – 54	55		26.0
≥55	48		22.8
Mean±SD	44.8±12.3		
Duration of Hair Loss			
< 1	11		5.2
1 – 4	66		31.3
5 – 9	27		12.8
≥10	35		16.6
I don't know	72		34.1
Family History of Hair Loss			
Yes	60		28.4
No	107		50.7
Don't know	44		20.9
Gender			
Male	51 (51.0)	49 (49.0)	<0.001
Female	160 (77.3)	47 (22.7)	

in 10.0% to ≥ once monthly in 39.4%. Hair dye was used in 18.8% only. The use of traditional head gear (turban-like) for the whole day was recorded in 76.9%, (Table 3). Amongst men, 58% had a low cut and 42% had completely shaven scalps.

In men, the observed hair practices were; natural short hair cut in 96% (96/100), dreadlocks in 1%(1/100) and chemically relaxed hair in 3%(3/100). All the men who had AGA, had natural short haircut.

Age (p=0.007) and hair style of females (p=0.020) were significantly associated with hair loss (Table 3). Hair loss was found to increase with age. The use of hair dye, turbans, chemical relaxers and frequency of hair wash did not contribute significantly to hair loss.

Hair loss was prevalent among females. The patterns of HL were patterned, diffuse and localized in 94.3%, 3.8% and 1.9% respectively. Traction alopecia was the commonest type of hair loss (71.7%) followed by male androgenetic alopecia, female androgenetic alopecia, seborrheic dermatitis and telogen effluvium in 22.3%, 4.6%, 1.4% and 0.5%, respectively. Eight females (3.8%) had 2 types of hair loss (7 had TA and female androgenetic alopecia and one had TA and CCCA). Table 4.

The common trichoscopy features of TA were white dots (98.7%), white dots regular distribution (94.3%), preserved honeycomb pigment (93.0%), reduced hair density (92.4%), variable diameter (69.4%), thin hair (50.3%), vellus hairs (39.5%), varying hair length (35.7%), peripillar white/gray halo (26.1%) and loss of follicular opening (12.1%), (Figure 2A). For AGA, the trichoscopy features were white dots (100%), white dots with regular distribution (98%), preserved honeycomb pigment (95.9%), reduced hair density (95.9%), variable diameter (71.4%), thin hair (49%), vellus hairs 36.7%), loss of follicular opening (20.4%), miniaturized hair (16.3%) and varying hair length (16.3%) (Figure 2B). Trichoscopy features in the only participant who had CCCA were: vellus hairs, thin hair, miniaturized hair, single hair from follicular opening, disrupted honeycomb pigment, variable diameter, peripilar grey halo, reduced hair density, loss of follicular opening, white patches and brown pigment.

DISCUSSION

Hair loss is a common phenomenon and it can be distressing for some affected individuals. In this study, we report a high prevalence of HL (68.7%) especially in females. The most common type of hair loss was non-scarring and mainly TA in females and AGA in males. Various haircare practices and age were associated with hair loss. Also, we report the trichoscopy features observed in the observed hair loss types.

The prevalence of hair loss in this study is higher than what has been reported in other community based studies of hair loss (68.7% compared to 31.8% and 40.03%).[7,8] Hair loss was significantly more in females. We opine that, the high prevalence of HL especially in females is due to the cultural and religious practice of wearing turban-like head gears all day with occlusion of blood supply to the hair roots, poor nutrition of the hair and hair loss.[30] Similar to our study, other authors report a higher prevalence of hair loss in females than males.[7,11] Females are said to engage in hair practices which pull hair from the roots, weaken the hair and result in hair loss unlike males.[7,18,31]

The prevalence of hair loss was noticed to increase with age irrespective of gender. This increasing prevalence of HL in females with age can be attributed to the long duration of harmful hair care practice and hormonal changes with age. In males, the increased prevalence of hair loss with age is attributed to hormonal influence on hair growth with increasing age.[10,12] In consonance with our study, other authors report an increased prevalence of hair loss with age.[9,12] The mean age of the participants who had hair loss is higher than that reported in other studies.[7,14,32] We are unable to account for this difference in age affected as all these studies were conducted in adults.

The predominant type of HL was non-scarring and patterned. Specifically, TA, AGA, CCCA, TE and hair loss due to seborrheic dermatitis were observed. We report a higher prevalence of non-scarring HL and a lower prevalence of scarring HL than that reported by Nnoruka 14 years ago.[6] A couple of reasons account for this difference. The study by Nnoruka had fewer participants than this study and was hospital based. In addition, a change in hair style practice may have resulted in this difference as this study had more participants braiding their hair and using hair extensions

Table 2: Hair Care Practices amongst Women with Hair Loss

Variables	Frequency	Percentage (%)
Most Frequent Hair Style		
Natural hair and braiding/weaving	37	23.2
Relaxed hair and braiding/weaving/weave-on	88	55
Natural and low cut	13	8.1
Packing	11	6.9
Others	11	6.9
Days between Relaxing and Fixing/Braiding		
1	17	10.6
2	14	8.8
3	22	13.8
4	2	1.3
5	8	5.0
>5	53	33.1
No response	44	27.5
Frequency of Change of Hair Style		
1 week	29	18.1
2 week	47	29.3
4 weeks	40	25.0
6 weeks	5	3.1
8 weeks	12	7.5
12 weeks	7	4.4
>12 weeks	2	1.3
No response	18	11.3
Frequency of Hair Wash		
Daily	16	10.0
Weekly	27	16.9
Every 2 weeks	49	30.6
Once a month	52	32.5
Greater than a month	11	6.9
No response	5	3.1

compared to Nnoruka's study.[6] The hair loss types are similar to that from other community based studies of HL in people of African descent.[6,7] However, our study had a higher prevalence of TA and AGA and, a lower prevalence of TE and CCCA than in these studies.[6,7] Telogen effluvium and CCCA are more commonly reported in hospital based studies.[6,15,16] Traction alopecia was common especially in females due to the prevalent hair practices of the participants. Androgenic alopecia was the most common type of hair loss in males. Androgenic alopecia is reported to be common as individuals age and most of the participants who had hair loss in this study were aged forty-five years and above.[12] A few participants (3.8%) had two types of HL. It is not unusual to have individuals presenting with more than one type of hair loss.[11]

A family history of hair loss was reported in first degree relations especially in mothers. Although studies on the genes responsible for hair loss are few, there are some hair loss types known to be common in children with affected parents (AGA, AA, CCCA).[25,26,31,33] The family history of HL is higher than that reported by Deo et al although their study was in females only.[14] Like our study, a family history of hair loss in first degree relations (mothers) is reported in the study by Tawfik, *et al.*[25]

The duration of hair loss in this study was less than five years in the majority of participants and in keeping with what is documented in other studies.[6,14,32] In most of the participants, hair loss was asymptomatic and the prevalent hair loss types in this study were AGA and TA. Furthermore, the participants may have believed it was a normal part of aging and a normal consequence of hair care to have HL hence the long duration without seeking medical intervention.

Amongst the females, the use of chemical relaxers, braids with hair extensions, fixing of weave-on and the cultural practice of turban-like hair gears were prevalent and observed. Only a few females had natural hair and some of them also had the hair either turbaned or styled with hair extensions. These hair styles result in tension at the root of the hair follicles thereby resulting in hair loss.[34] Chemical relaxers cause a reduction in amino-acid content of hair, increased hair fragility with easy hair damage and HL.[7,17]

Most of the participants had an interval of less than three days between application of chemical hair relaxers and braiding or fixing of weave-on. The hair in these individuals suffers a double assault. The application of chemical hair relaxers to straighten the hair already weakens them at their root and having to braid and fix weave-on within this short interval makes it easy to lose the hair. In this study, only age and hair style type (chemical relaxers in combination with braids or weave-on) were associated with hair loss despite the high frequency of the use of chemical hair relaxers, turban-like head gear, infrequent hair wash and infrequent change of hair styles. The common use of chemical hair relaxers by African women and its association with hair loss is variously documented in other studies of women of African descent.[6,7,17,18,34]

Compared to existing literature among Caucasians, there are few studies documenting trichoscopy findings in Africans.[23,24] The participants in this study had mostly non-scarring alopecia and thus had preserved honey comb pigment, white dots and white dots with regular distribution. These features are typical of non-scarring HL where there is preservation of follicular architecture and sweat ducts.[20,21,25,27]

Additionally, thin hair, vellus hairs, hair with variable diameter and varying hair length, peripilar white/gray halo and loss of follicular opening were seen in TA. Peripilar white/gray halo was found in follicles with absent hair. Peripilar white/

Fig. 1A: Observed Hair Styles.

A. Cornrows B. Chemically relaxed hair C. Threading of hair D. Chemically relaxed hair in twists E. Natural hair in twists F. Braided hair with hair extensions G. Chemically relaxed hair in a tight bun H. Natural hair cut short. I &J. Males with short haircut.

Figure 1B. Hair Loss Types.

A. Diffuse hair loss B, C, D & E Patterned hair loss; Traction alopecia F&G Patterned hair loss; Androgenetic alopecia.

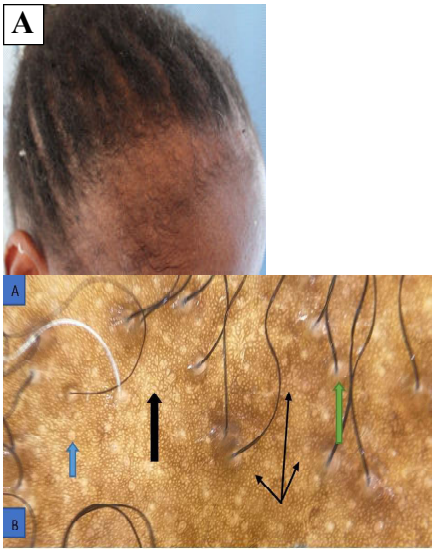

Fig. 2A: Photograph of MTA and Trichoscopy.

A. Photograph of frontal marginal traction alopecia.
B. Tricoscopy of Marginal traction alopecia X20 magnification
Thick black arrow-Preserved honeycomb pigment Green arrow –Peripilar whit halo Blue arrow –Empty hair follicles Thin black arrows- Follicular white dots with regular distribution.

gray halo and loss of follicular opening are seen when there is no prospect of hair regrowth (scarring).[28] Traction alopecia is a biphasic type of alopecia with features of scarring at end stage when inducing practices persist.[35]

In participants who had AGA, a variable diameter and varying hair length, thin hair, vellus hairs, loss of follicular opening, and miniaturized hair were observed. These features were a mix of features of non-scarring and scarring alopecia.[25,29] Androgenetic alopecia at end stage shows features of scarring hair loss.[25] Trichoscopy features in the only participant who had central centrifugal cicatricial alopecia typified a scarring type of hair loss with single hair from follicular opening, disrupted honeycomb pigment, loss of follicular opening, white patches and brown pigment.[20] The areas with brown pigment are indicative of pigment incontinence as a result of perifollicular lymphocytic infiltrates implicated in the pathogenesis of CCCA. The trichoscopy features observed in the different hair loss types were no different

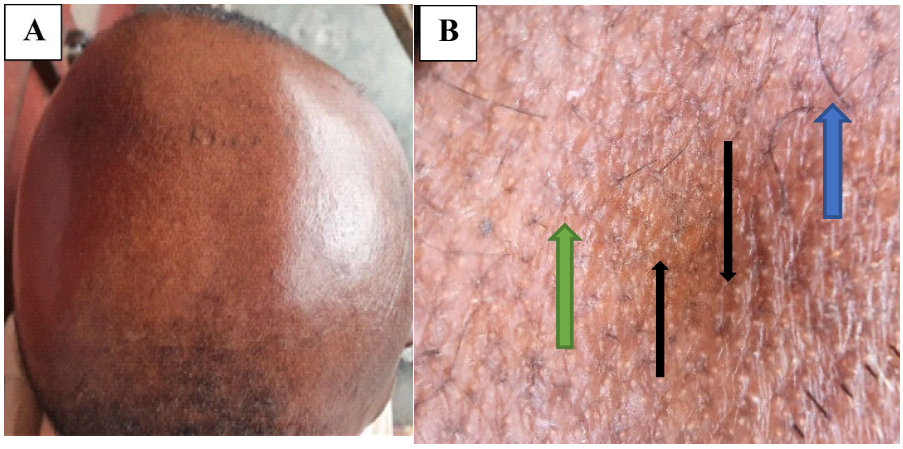

Fig. 2B: Photograph of AGA and Trichoscopy.

A. Photograph of AGA Trichoscopy of AGA X10magnification

B. Green arrow-Preserved honeycomb pigment Black arrows –White dots Blue arrow – Single velus hair.

Table 3: Factors Associated with Hair Loss among Women

Variables	Hair Loss		p
	Yes n = 160 (%)	No n = 47 (%)	
Type of Hair			
Natural	27(16.9)	15 (31.9)	0.020
Relaxed	109 (68.1)	21 (44.7)	
Natural and low cut	13 (8.1)	7 (14.9)	
Ponytail	11 (6.9)	4 (8.5)	
Age group (Years)			
<25	11 (6.9)	7 (14.9)	
25 – 29	11 (6.9)	6 (12.8)	
30 – 34	13 (8.1)	6 (12.8)	
35 – 39	26 (16.3)	8 (17.0)	
40 – 44	27 (16.9)	6 (12.8)	
45 – 49	19 (11.9)	6 (12.8)	
50 – 54	17 (10.6)	3 (6.4)	
55 – 59	12 (7.5)	2 (4.3)	
≥60	24 (15.0)	3 (6.4)	
Mean±SD	44.0±12.7	38.2±13.0	0.007
Use of Gele (Turban Style) all day			
Yes	123 (76.9)	30 (66.7)	0.164
No	37 (23.1)	15 (33.3)	
Use of Chemical Relaxer			
Yes	118 (73.8)	33 (70.2)	0.631
No	42 (26.2)	14 (29.8)	
Dye Hair			
Yes	30 (18.8)	7 (14.9)	0.544
No	130 (81.2)	40 (85.1)	
Frequency of hair wash			
Daily	16 (10.0)	8 (17.0)	0.351
Weekly	27 (16.9)	12 (25.5)	
Every 2 weeks	49 (30.6)	14 (29.8)	
Once a month	52 (32.5)	10 (21.3)	
More than more month	3 (6.4)		

from that already reported by other authors.[20,21,25,27,28]

The strength of this study is that it was conducted in a community with clinical evaluation by board certified dermatologists. To the knowledge of the authors, this is the first study documenting the trichoscopy features of different hair loss types from this region. There were limitations to this study. The study was conducted in one location, in adults only and amongst a specific occupational group. The result of this is that hair loss in children and adolescents was not evaluated. In addition, a larger population was to be studied but made impossible by the COVID-19 pandemic and the associated restrictions. Furthermore, being a field study, hair loss types could not be histologically confirmed.

In conclusion, hair loss is common in the community and the two most common types are TA and AGA. Age and hair care practices are associated with this HL. Education of the populace on proper hair care practices can mitigate TA type of HL. The trichoscopy features observed were similar to findings in the literature. Trichoscopy being a non-invasive method of hair and scalp evaluation reduces the need for biopsy for histopathological evaluations and should be encouraged.

Main Findings

- A high prevalence of hair loss
- Patterned hair loss (traction and androgenetic alopecia)
- Hair loss is due mainly to hair care practices in females.
- Documentation of trichoscopy features of hair loss in an African Community.

Declarations

The authors declare that, this is an original publication and that, it is not being considered elsewhere.

Conflict of Interest

The authors have no conflict of interest.

Ethics

Ethical approval for the study was obtained from the ethics review board of the Lagos State University Teaching

Table 4: Pattern of Hair Loss among Participants

Variable	Men n = 51 (%)	Women n = 160 (%)	Total n=211 (%)
Pattern of Hair Loss			
Diffuse	1 (2.0)	7 (4.4)	8(3.8)
Localized	0 (0.0)	4 (2.5)	4(1.9)
Patterned	50 (98.0)	149 (93.1)	199(94.3)
Type of Hair Loss			
Scarring	1 (2.0)	0 (0.0)	1(0.5)
Non scarring	50 (98.0)	159 (99.4)	209(99.0)
Both	0 (0.0)	1 (0.6)	1(0.5)
Types of non-Scarring Hair Loss			
Traction alopecia	0 (0.0)	157 (98.1)	157(71.7)
Telogen effluvium	0 (0.0)	1 (0.6)	1(0.5)
Female androgenetic alopecia**	0 (0.0)	10 (6.3)	10(4.6)
Male androgenic alopecia	49 (96.1)	NA	49(22.3)
Seborrhoeic dermatitis	2 (3.9)	1 (0.6)	3(1.4)
Types of Scarring Hair Loss			
Central centrifugal cicatrical alopecia	N/A	1 (0.6)	1(0.5)

*Two hair loss types in 8 women.***

Hospital (LREC/06/10/1297). Written consent was obtained from the participants.

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