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"DERMOSCOPIC STUDY OF ANDROGENIC ALOPECIA IN MEN"

Dermatology

Dr Bhavesh Songara Resident doctor, Department of dermatology, Sir T hospital, Bhavnagar

Dr. Bhavesh Astik* Associate Professor, Dept. of Dermatology, Venereology and Leprosy, Bhavnagar *Corresponding Author

Dr Hita Mehta Professor and Head, Department of dermatology, Bhavnagar,Gujarat.

ABSTRACT

Background: Androgenic alopecia (AGA) is the most common form of hair loss in men characterized by a progressive patterned loss of terminal hair. Dermoscopy of scalp (Trichoscopy) is a new non-invasive technique applied to facilitate the diagnosis of hair and scalp Disorders.
Aims: To study dermoscopic pattern of androgenic alopecia in men.
Materials and methods: A single centre hospital-based descriptive study of a total of 49 patients with androgenic alopecia was carried out. Dermoscopy was performed in all cases on fronto-temporal, vertex and occiput area by dermatoscope (Dermlite DL4).
Results: Single hair follicular unit, Hair shaft diameter variation, white dots and yellow dots were predominantly observed over fronto-temporal area. The most common grade in our study was H-N Grade II 20 cases (40%) followed by Grade III 16 cases (32%).
Conclusion: We observed that SHFU and HSDV are predominant dermoscopic finding on fronto-temporal area which less observed over vertex and occiput.

KEYWORDS

Androgenic alopecia, Dermoscopy, Yellow dots, Hair shaft diameter variation.

INTRODUCTION

Androgenetic alopecia (AGA) is the most common form of hair loss both in men and women and is characterized by a progressive patterned loss of terminal hair diameter, length, and pigmentation on the frontal scalp and/or vertex of the scalp, seen with increasing age in genetically predisposed individuals.[1,2] Until recently, a scalp biopsy was the only objective tool to diagnose and monitor the disease severity. Dermoscopy of scalp (Trichoscopy) is a new fast, noninvasive, and cost-efficient technique that improves diagnostic accuracy and follow-up with hair and scalp disorders. [3] In trichoscopy, hair and scalp structures may be visualized at many fold magnification. The method allows *in vivo* visualization of the epidermal portion of hair follicles and perifollicular epidermis and hair shafts at high magnification and performing measurements, such as hair shaft thickness, without the need of removing hair for diagnostic purposes.

METHODOLOGY

A descriptive study of a total of 49 patients was carried out at the out-patient department of dermatology, government medical college and Sir T hospital, Bhavnagar, after ethical approval from Institute ethical committees. Any patient attending dermatology OPD with age between 18 to 60 years, with androgenic alopecia either of Grade I to VII (according to Hamilton –Norwood classification of hair loss) AGA were enrolled in the study after taking written informed consent.

Study design – Single centre hospital-based cross-sectional study.

Exclusion criteria.
Patient with other alopecia diseases (except AGA), scalp psoriasis, infection, seborrheic dermatitis, other dermatological disorder with scarring alopecia.

After enrolling the patient, thorough history and detailed examination were done. The following parameters: age, sex, age of onset, family history, and duration were recorded by using a predesigned case record form. After informed written consent dermoscopy was performed in all cases on fronto-temporal, vertex and occiput area by dermatoscope (Dermlite DL4) attached to a smartphone with smartphone adaptor and stored. The images were analyzed, dermoscopic features were assessed independently by two independent dermoscopists.

Following dermoscopic features were studied- Variation Hair shaft diameter(>20%)(VHSD), Yellow dots, Single follicular unit(SHFU), Multi hair follicular unit(MHFU), Peripilar sign, White dots, Structureless white area, Honeycomb pigment pattern(HCPP) and Black dots. Patients were given appropriate treatment when needed.

All data were plotted on excel sheets. Categorical and nominal data were expressed in percentages. The significance threshold of the p-value was set at <0.05. All analysis was carried out by using GraphPad INSTAT software version 3.06, 32 bit for windows.

RESULT

The age of the patients varied from 18 to 58 years (mean, 27.3±4.4 years). 31 out of 49 have positive family history. Mean duration of disease was 3.6 ± 2.4 years. The most common grade in our study was H-N Grade II 20 cases (40%) followed by Grade III 16 cases (32%).**Table 1** shows the proportion of various dermoscopic findings of AGA on fronto-temporal, vertex and occipital area.

Hair shaft diameter variation (HSDV) (>20%), single follicular unit (SHFU) and white dots (WD) were predominately observed over fronto-temoral area compared to occipital area (spared area in AGA). Table 2 shows clinical and dermoscopic correlation in H-N grades of male androgenetic alopecia (Fronto-temporal area).

Table 1. Proportion of various dermoscopic findings of AGA on fronto-temporal, vertex and occipital area.

Dermoscopic findings of AGA	Fronto-temporal (Total 49)	Vertex (Total 49)	Occiput (Control) (Total 49)	Comparison between fronto-temporal and coccipital(control) area. (P value)	Comparison between vertex and coccipital(control) area. (P value)
Hair shaft diameterVariation (HSDV) (>20%)	44 (88%)	3 (6%)	0 (0%)	-	-
Yellow dots (YD)	19 (38%)	0 (0%)	0 (0%)	-	-
Single follicular unit(SHFU)	48 (97%)	32 (64%)	2 (4%)	<0.0001	<0.0001
Multihair follicular unit(MHFU)	14 (28%)	45 (91%)	49 (100%)	<0.0001	0.1173
Peripilar sign	16 (33%)	3 (6%)	0 (0%)	-	-
White dots (WD)	38 (77%)	3 (6%)	1 (2%)	<0.0001	0.6171
Structureless white area (SWA)	17 (35%)	1 (2%)	0 (0%)	-	-
Honeycomb pigment pattern(HCPP)	23 (47%)	8 (16%)	4 (8%)	<0.0001	0.3560
Black dots (BD)	10 (20%)	2 (4%)	0 (0%)	-	-

Table 2: Clinical and dermoscopic correlation in H-N grades of male androgenetic alopecia.(Fronto-temporal area)

H-N grade (Number of patient)	GRADE- I (2)	GRADE- II (20)	GRADE- III (16)	GRADE- IV (9)	GRADE-V (1)	GRADE-VI (1)	GRADE- VII (0)
Variation Hair shaft diameter (>20%)	1(50%)	18(90%)	16(100%)	7(78%)	1(100%)	1(100%)	-
Yellow dots (YD)	1(50%)	8(40%)	5(31%)	4(44%)	1(100%)	-	-
Single follicular unit(SHFU)	2(100%)	19(95%)	16(100%)	9(100%)	1(100%)	1(100%)	-
Multihair follicular unit(MHFU)	1(50%)	9(45%)	2(12.5%)	2(22%)	-	-	-
Peripilar sign	-	6(30%)	5(31%)	4(44%)	-	1(100%)	-
White dots (WD)	1(50%)	14(70%)	14(87%)	7(78%)	1(100%)	1(100%)	-
Structureless white area (SWA)	-	6(30%)	4(25%)	5((55%)	1(100%)	1(100%)	-
Honeycomb pigment pattern(HCPP)	-	9(45%)	9(56%)	4(44%)	-	1(100%)	-
Black dots (BD)	-	5(25%)	4(25%)	1(11%)	-	-	-

DISCUSSION

The mean age of patient with AGA in our study was 27.3 years (SD ± 4.4), which is nearer to the studies done in Indian population by Grover [4]. The most common grade in our study was H-N Grade II 20 cases (40%) followed by Grade III 16 cases (32%) in contrast H-N Grade III followed by Grade II observed by Sehgal *et al*. [5] Grover[4] in Indian population and by Paik *et al*. in the Korean population.[6]

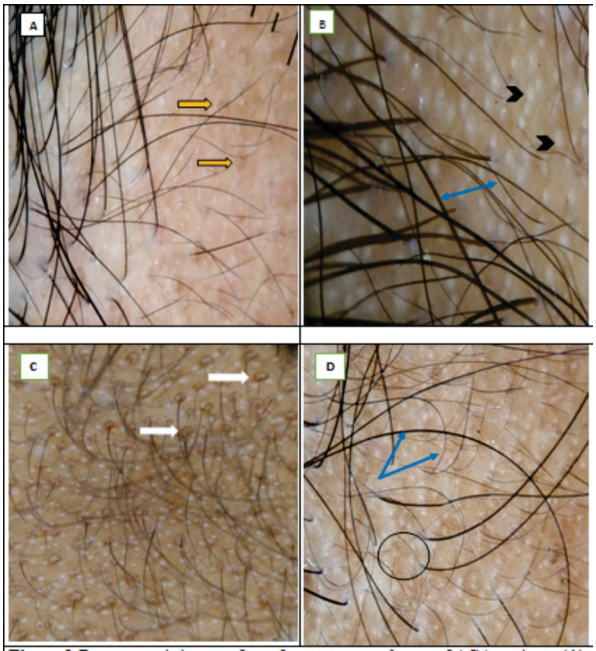

Figure 1.Dermoscopic images from fronto-temporal area of AGA patients.**(A)**-Brown/Yellow dots(yellow arrow),single hair follicular unit**(B)**-Multiple white dots(Black arrow head), Hair shaft diameter variation(Blue arrows) **(C)**-Perifollicular discoloration/peripilar sign (white arrow)**(D)**- Honeycomb pigmentation(Black circle).

Variation in hair shaft diameter is an important major diagnostic criterion for AGA as mentioned by Rakowska *et al.* They represent increased proportion of thin and vellus hairs on the bald patch due to progressive miniaturized hair follicles. [7] This was a consistent finding in all age group and H-N stages in our study (Figure 1 A,B,D).Normally, healthy scalp consists of follicular units with 1–4 hairs arising. However, in AGA, follicular units with single hairs predominate in the frontal area compared to vertex and occiput [7]. We observed a significantly decreased proportion of multi follicular units over fronto-temporal area in AGA patients.(Figure 1 A,B,D).

Perifollicular discoloration/halo/peripilar sign is another important dermoscopic finding in AGA which corresponds to lymphocytic infiltrate around the hair follicle.(Figure 1 C). It is observed in early stage of AGA and is not specific for AGA as it also sometimes found in telogen effluvium.[8]

Yellow dots(YD) are first described as uniform pink-yellow color dots by Ross et al. [9] YD corresponds to active sebaceous glands which produce intraepidermal sebum collectionafter the advanced miniaturized hair follicles. Rudnicka *et al.* have mentioned that YD varies in size, color, and shape [10]. We observed yellowish to brown color dots of irregular size and number with individual variation.(Figure 1 A). Brownish hue may be due to dark skin color of most of our patients similarly observed in other studiesby Kabir et al and other [11,12]

Abraham et al. related WD to eccrine glands and follicular ostia histologically in their study [13] Follicles can be replaced by connective tissues, leading to fibrous tracts and finally causing atrophy in follicles in advanced disease. These empty follicular ostia are seen as WD.[9] We observed the predominate number of WD over the frontal area compared to vertex and occiput ((Figure 1 B).Honeycomb pigmentation was found in 47 % of patients in our study (Figure 1 D), whereas in a Chinese study by Hu *et al*. HCP was seen in 33.2% of male AGA.**Table 3** shows comparison of our study with similar other studies.[12,14]

Table 3. Comparison with other similar other study.

Dermoscopic findings of AGA	Our study (Total 49) N (%)	M kabir et al (Total 63) N (%)	Vora R et al[14] (Total 67) N (%)
Variation Hair shaft diameter (>20%)	44 (88%)	63(100%)	47(70%)
Yellow dots	19 (38%)	16(15.4%)	50(74.6%)
Single follicular unit(SHFU)	48 (97%)	-	-
Multihair follicular unit(MHFU)	14 (28%)	38(60.3 %)	-
Peripilar sign	16 (33%)	29(46 %)	32(46.2%)
White dots	38 (77%)	18(28.6 %)	-
Structureless white area	17 (35%)	-	-
Honeycomb pigment pattern(HCPP)	23 (47%)	16(25.4%)	-
Black dots	10 (20%)	-	-
Structureless red area	-	33(52.4%)	-

We observed that SHFU and HSDV are predominant dermoscopic finding on fronto-temporal area which less observed over vertex and occiput (Figure 2 A1-3 B1-3). We observed statistically significant difference between dermoscopic findings of fronto-temporal and occiput area among SHFU, MHFU, WD and HCPP among them only SHFU was significant between vertex and occiput (Table 1).To have better inference, a study with a larger number of patients should be done.

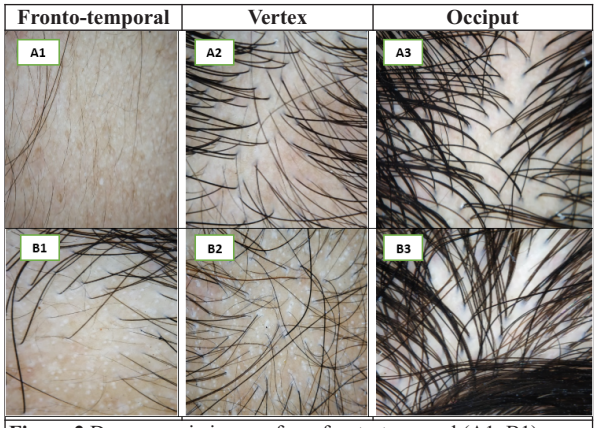

Figure 2. Dermoscopic images from fronto-temporal (A1, B1), vertex (A2, B2) and occiput (A3, B3) area of AGA patients. (A1,B1)-Multiple YD,WD,SHFU(thin vellus hair), (A2,B2)-Increase inter-follicular distance, Multiple stuctureless white area, HCPP,HSDV, few SHFU (A3,B3)- Multiple hair follicular units.

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