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Original Research Article

Dermatoscopic Findings in Androgenetic Alopecia

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Abstract:

Background: Androgenetic alopecia (AGA) is the term used to describe the typical, gradual patterned thinning of terminal hair on the scalp in a genetically predisposed individual. The diagnosis of this condition is mainly clinical. Previously, the only definitive way to diagnose and assess the extent of the condition was through a scalp biopsy. However, a new non-invasive method known as trichoscopy has emerged, offering an alternative approach. Trichoscopy involves using dermoscopy to capture images of the scalp and hair. This technique allows for the visualization of various structures such as openings of hair follicles, hair shafts, the perifollicular epidermis, and cutaneous microvasculature.

Objectives: To study the trichoscopic features of androgenetic alopecia.

Material and Methods: 80 patients with AGA (50 male and 30 female) were enrolled in this study. Data on age, gender, personal and family history, clinical type, onset and duration of disease were collected and evaluated. Trichoscopic examination was performed using video dermatoscope. Trichoscopy results were obtained in frontal, occipital and both temporal areas of the scalp. The data were statistically evaluated.

Results: Hairshaft thickness heterogeneity (HSTH) was the most common trichoscopic feature seen in all the patients enrolled in the study. Brown peripilar sign was seen in 30 patients, white peripilar sign in 24 patients, pin point white dots in 20 patients, yellow dots in 2 patients, focal atrichia in 12 patients, scalp honeycomb pigmentation in 15 patients.

Conclusion and recommendations: Trichoscopy is a simple, non-invasive tool that aids in diagnosis of AGA, allowing various sections of hair to be examined simultaneously. It provides easy documentation which also helps in evaluating a therapeutic response by comparing pre and post treatment images.

Introduction

AGA is characterized by miniaturization of the hair follicle, leading to vellus transformation of terminal hair follicle resulting from alteration in the hair cycle dynamics, affecting both males and females. This process culminates in a gradual reduction of the visible density of hair on the scalp. Though the pathogenesis of AGA in males and females is same, their clinical feature varies.

In men, termed MAGA (Male Androgenetic Alopecia), the defining features include a classic receding hairline at the temples and hair thinning on the vertex. In contrast, female androgenetic alopecia (FAGA) is distinguished by a broader and more evenly spread thinning cross the crown region, while the frontal hairline remains unaffected. The diagnosis of AGA mainly involves clinical observation, assessment of hair loss patterns. Other techniques employed to identify hair-related conditions include conducting a hair pull test, using trichograms, performing biopsies, and conducting blood tests for screening. These methods differ in their sensitivity, reproducibility, and invasiveness levels. Trichoscopy serves as a valuable tool for diagnosing scalp and hair disorders in a simple and non-invasive manner, significantly enhancing clinical management. [1] The basic principle of dermatoscopy involves illuminating a lesion and closely examining it under high magnification to reveal subtle features. Trichoscopy enables the visualization of structures like hair follicle openings, hair shafts, the perifollicular epidermis, and cutaneous microvasculature. This technique facilitates the analysis of both acquired and congenital hair disorders.

Material and Methods: A cross sectional and observational study was conducted on 80 patients with complaints of hair loss, visiting Department of Dermatology venereology and leprosy, Rama medical college hospital and research centre, Hapur. After informed consent, brief history was taken and clinical examination was done. The following factors were considered: sex, age, personal and

family history, onset and duration of disease, sites involved. Hair pull test was performed. The diagnosis of AGA was based on history and clinical assessment. Scalp examination was done and patients were graded according to basic and specific classification of AGA. Trichoscopy was done and findings were noted.

The results were tabulated and analysed using SPSS Software 23.0 version. Percentages and mean values with standard deviation were calculated wherever applicable.

Results:

Among the 80 patients included in this study, 50 (62.5%) patients were men and 30 (37.5%) patients were women. The average age of the patients was 42, varying from 22 to 60 years old. There was no statistically significant difference between genders with respect to age ($p>0.05$). Family history was positive for AGA in 64 of 80 (75.29%) patients. The duration of AGA ranged from 2 to 89 months.

The dermatoscopic features observed in male and female pattern hair loss included hairshaft thickness heterogeneity (HSTH) (Figure:1), Brown peripilar sign (BPPS) (Figure:2), white peripilar sign (WPSS) (Figure:3), pin-point white dots (Figure:4), yellow dots (Figure:5), focal atrichia (Figure:6), scalp honeycomb pigmentation (Figure:7). The most common feature was hairshaft thickness heterogeneity, which was seen in all the patients (100%) enrolled in this study. Brown peripilar sign was seen in 30 patients (37.5%), white peripilar sign in 24 patients (30%), pin point white dots in 20 patients (25%), yellow dots in 2 patients (2.5%), focal atrichia in 12 patients (15%) and scalp honeycomb pigmentation in 15 patients out of the 80 (18.75%). The results are tabulated in Table: 1.

Table 1: trichoscopic features in androgenetic alopecia

Trichoscopic Features	Number	Percentage (%)
Hairshaft Thickness Heterogeneity (HSTH)	80	100
Brown Peripilar Sign (BPPS)	30	37.5
White Peripilar Sign (WPSS)	24	30
Pin point white dots	20	25
Yellow Dots	2	2.5
Focal Atrichia	12	15
Scalp Honeycomb Pigmentation	15	18.75

Figure 1: HSTH

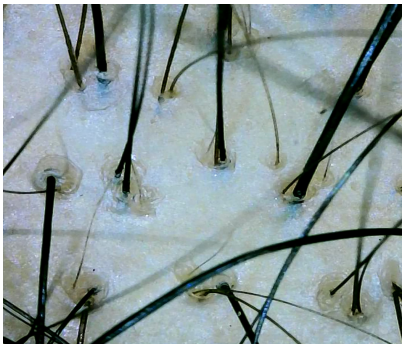

Figure 2: Brown peripilar sign

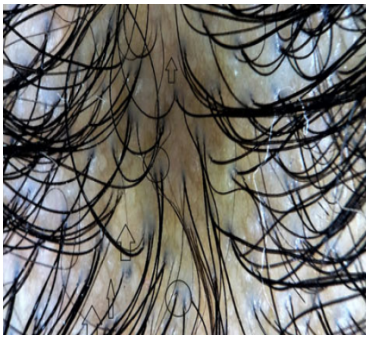

Figure 3: white peripilar sign (circles)

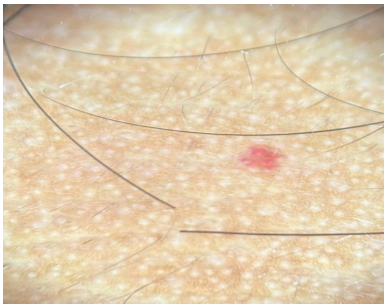

Figure 4: pin point white dots

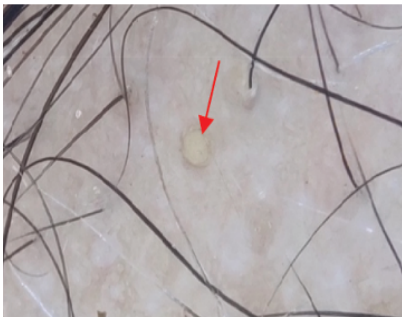

Figure 5: yellow dots

Figure 6: focal atrichia

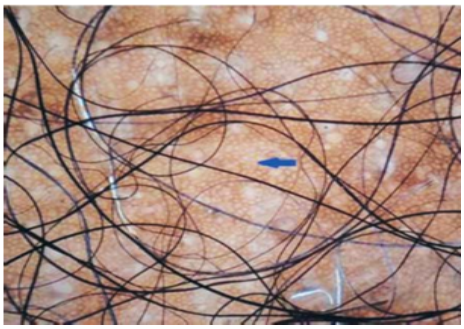

Figure 7: Scalp Honeycomb Pigmentation

Discussion

We diagnosed androgenetic alopecia (AGA) clinically by observing thinning of in the affected area and noting the presence of a receding hairline in males or a broadening of the central partition in females. Subsequently, we conducted a hair pull test, which yielded negative results for all patients. The common trichoscopy findings in AGA are Hair shaft thickness heterogeneity (HSTH), brown peri-pilar sign (BPPS), white peri-pilar sign (WPPS), yellow dots, pinpoint white dot, focal atrichia, scalp honeycomb pigmentation. [2]

In our study, the most common dermatoscopic feature was hairshaft thickness heterogeneity, seen in 100% of patients. Hair shaft thickness heterogeneity, also named "hair diameter diversity", caused by progressive and unsynchronized miniaturization of hair follicles in genetically predisposed individual, corresponds to vellus hair transformation. [2] Both men and women with AGA have HSTH as the most common feature. [3] In a study conducted by Govindarajaulu et al. on 100 participants, they also observed the prevalence of variation in hair diameters, aligning with our observations. [4] Similarly, Inui et al. conducted research that yielded comparable results. [5] The significance of hair diameter diversity has been established, with more than 20% variation in males and 10% in females considered noteworthy. [2] It has also been recognized as a principal criterion for FPHL, as outlined by Rakowska et al. [6]

We observed brown peripilar sign in 37.5% of the patients. Earlier studies conducted in the Asian population documented detection rates of 66% among males and 20% among females. [5]

Brown peri-pilar sign, characterized by a brown halo around the emergent hair shaft with a diameter of approximately 1 mm, is linked to superficial perifollicular lymphocytic infiltrates. [7]

However, Hu et al. observed that the peripilar sign varied from brown to white color. The latter demonstrated a white halo at the follicular ostium, which was named WPPS, and was seen in 20.7% of male and 15.0% of female AGA patients in their study. [2] We observed white peripilar sign in 30% of the patients.

Yellow dots were observed in 2.5% of the patients in this study. These dots contain excessive sebum secreted by intact sebaceous gland in absence of terminal hair. Hu et al. reported a variable number of yellow dots of different sizes which was seen in approximately 20% of AGA patients. [2]

Pinpoint white dots correspond to the empty hair follicle ostia. It was seen in 25% of the patients in our study. In the study by Hu et al., similar findings were observed. Pinpoint white dots were seen in 27.3% of male and 22.0% of female AGA patients. [2]

Focal atrichia is pencil erased areas of hair loss located on scalp. [8] This was observed in 15% of the patients in our study. Scalp honeycomb pigmentation is formed by hypomelanotic areas (less in overlying dermal papillae) bordered by hyper chromic lines (melanin of rete ridges). It occurs due to sun exposure, and is usually seen in thinning or completely balding areas. In the study by Hu et al., it was seen in approximately 30% of the patients. [2] This feature was seen in 18.75% of the patients in our study.

Trichoscopy has surfaced as an uncomplicated and non-intrusive technique for identifying disorders of the hair and scalp. It assists in identifying diverse patterns of hair loss and distinctive structures, enhancing the diagnostic acumen of observers regarding hair-related conditions. Our research primarily focused on scrutinizing the trichoscopic attributes of AGA. Consequently, trichoscopy stands as an innovative diagnostic instrument, facilitating the evaluation of conditions and their extent, thereby enabling the formulation of early intervention strategies to prevent the advancement of hair loss.

Ethical Clearance- Taken from Institutional Ethical Committee

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