Our Dermatology Online

Original Article

Correlation between trichoscopic findings and disease severity in female-pattern hair loss

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ABSTRACT

Background: Female-pattern hair loss (FPHL) is a common form of hair loss in women and is referred to as androgenetic alopecia. It is characterized by diffuse reduction in hair density on the crown and frontal scalp with retention of the frontal hairline. **Objective:** This study aimed to examine the trichoscopic findings of FPHL and to correlate their relationship with disease severity in our tertiary care hospital. **Materials and Methods:** This was a prospective, observational study in which a total of thirty female patients of the age group between 18 and 45 years were included at the outpatient dermatology department within six months. The diagnosis of FPHL was based on clinical grounds. Trichoscopic evaluation was performed under the dermatoscope. Statistical significance in the difference in the outcome variables between the stages was assessed by the Fisher's exact test. The statistical test was considered statistically significant at $P < 0.05$. **Results:** A positive correlation between clinical and trichoscopic findings with respect to disease severity was seen. HSTH > 10% was seen in all grades of FPHL. BPPS and the multi-hair follicular unit were seen in early grades of FPHL ($P < 0.01$); WPPS, focal atrichia, and scalp honeycomb pigmentation were seen in later grades of FPHL ($P < 0.01$). **Conclusion:** Our study showed the significance of trichoscopy in patients with FPHL. As trichoscopy may reveal early changes in hair follicle diameter before hair loss becomes clinically visible. Regular clinical and trichoscopic follow-ups are highly important to monitor disease activity and treatment tolerance.

Key words: FPHL; Dermatoscopy; Trichoscopy

INTRODUCTION

Female-pattern hair loss (FPHL) is a common form of hair loss in women and is referred to as androgenetic alopecia. It is characterized by diffuse reduction in hair density on the crown and frontal scalp with retention of the frontal hairline [1].

In AGA, genetically-predisposed individuals [2] are exposed to androgen-responsive hair follicles that shorten the anagen phase, resulting in vellus hair. The result is a progressive decline in visible scalp hair density [3].

FPHL severity has been graded with the Ludwig scale, which classifies the severity of hair density reduction on the crown into three grades.

Standard methods employed to diagnose hair disorders are a history of events, clinical inspection, a pattern of hair loss, the pull test, a trichogram, a biopsy, and screening blood tests [4]. These vary in sensitivity and invasiveness.

Recent studies have accumulated evidence that the use of trichoscopy in the clinical evaluation of hair disorders improves diagnostic capability more than simple clinical evaluation [5]. Trichoscopy of the scalp is a novel, non-invasive technique employed to diagnose hair and scalp disorders with a manual or video dermatoscope with lenses ranging in magnification from 20× to 1000×. The usual working magnification is 10× to 100× [6].

The objective of this study was to evaluate the correlation between trichoscopy and the clinical

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grading of the disease for the diagnosis of hair loss in women.

MATERIALS AND METHODS

Each female patient in the age group between 18 and 45 years underwent a detailed general, physical, systemic, and dermatological examination. The diagnosis of FPHL was reached based on the Ludwig stages clinically. The type of hair loss in each patient was recorded.

Study Design

This was a prospective, observational study at the outpatient dermatology department of MVJ Medical College and Research Hospital lasting six months.

Sample Size

A total of thirty patients clinically diagnosed with FPHL were included in the study after receiving appropriate informed consent.

Exclusion Criteria

The exclusion criteria were as follows: pregnancy, lactating mothers, patients on hormonal replacement therapy, alopecia areata, telogen effluvium, and other scalp disorders (psoriasis, seborrheic dermatitis, tinea capitis).

The trichoscopic evaluation was performed on every patient. Trichoscopic patterns of the disease were recorded and the necessary pictures were saved. Trichoscopy image capturing was performed by a single person to avoid diversification. The selection of the trichoscopic variables included in the evaluation process was based on the available literature data and expertise.

Fields Examined on Trichoscopy

The frontal, crown areas and the occipital area were observed. Images were captured for analysis.

Parameters for Trichoscopic Examination

Hair shaft thickness heterogeneity (HSTH) (Fig. 1a): > 10% in female-pattern hair loss, which corresponds to vellus hair transformation, is the feature of AGA.

The brown peripilar sign (BPPS) (Fig. 1b) is a brown halo around the emergent hair shaft.

The white peripilar sign (WPPS) (Fig. 1c) is a larger, white halo at the follicular ostium.

The yellow dots are round or polycyclic, best seen under polarized light, reflect an empty hair follicle.

The focal atrichia are areas of total hair loss on the scalp, usually in a size of a pencil eraser.

Scalp honeycomb pigmentation (SHCP) (Fig. 1d) corresponds to melanotic rete ridges.

The multi-hair follicular unit is 2–3 hairs per follicular unit [7].

Ethics Statement

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the 2008 revision of the Declaration of Helsinki of 1975.

Statement of Informed Consent

Informed consent for participation in this study was obtained from all patients.

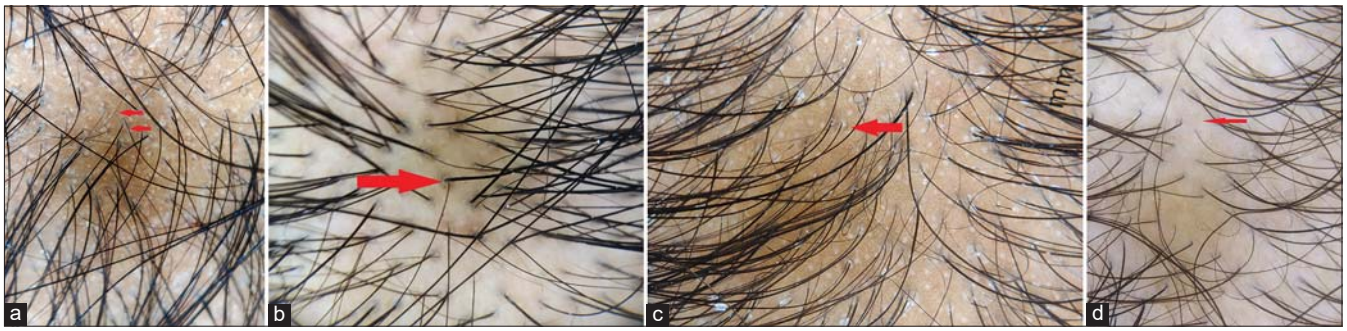

Figure 1: (a) Hair shaft thickness heterogeneity (HSTH). (b) Brown peripilar sign (BPPS). (c) White peripilar sign (WPPS). (d) Scalp honeycomb pigmentation (SHCP).

RESULTS

Patients with FPHL have HSTH as the most common feature in all grades. BPPS and the multi-hair follicular unit are seen in early grades of AGA ($P < 0.05$) (Table 1 and 2).

WPPS, scalp honeycomb pigmentation, and focal atrichia are seen in later grades of AGA ($P < 0.05$).

DISCUSSION

In our study, the age of onset was 21–40 years (75.4%). The mean age of the patients studied was 30.77 ± 8.45 years. A majority (43.3%) of the patients presented hair loss between 6 and 12 months of the duration of onset.

The pattern of hair loss was graded according to Ludwig's classification, Out of the thirty cases, 11 (36.66%) and 11 (36.66%) cases were Ludwig stage I and grade III, respectively, which was the highest in our study.

The mean age of the patients in our study was 30.77 ± 8.45 years and the age group was similar to the study conducted by Mahira et al. [7]. Their age ranged from 19 to 45 years, with a mean of 27.8 ± 7.9 years. In a study conducted by Okram et al. [8] and Zhang et al. [9], the mean age of onset of hair loss among the patients was 28.03 ± 8.05 years, with 60% of the patients having the onset of hair loss within thirty years.

Hairs Shaft Thickness Heterogenicity

With HSTH previously reported to be considered a hallmark of AGA [10], we found in our study that patients with FPHL had HSTH as the most common feature. Similar results were reported by Hu et al. [11], Ozlem Karadag et al. [12], Kibar et al. [13], stating that HSTH was the most common finding in their studies. A study done on 89 patients with FPHL by Galliker and Trüeb [14] revealed that HSTH was seen in 72% of early and 100% of advanced FAGA.

Table 1: Number of cases in each grade of the Ludwig's scale

Ludwig's Grade	Grade I	Grade II	Grade III
No. of Cases (*n*)	11	8	11

Table 2: Trichoscopic variables in each of the grades

Trichoscopic Variable	Grade I *n* = 11	Grade II *n* = 8	Grade III *n* = 11	*p* value
HSTH > 10%	11 (100%)	8 (100%)	11 (100%)	1
BPPS	7 (63.6%)	2 (25%)	1 (9%)	0.02*
WPPS	2 (18%)	1 (9%)	7 (63.6%)	0.02*
Yellow dots	2 (18%)	3 (37.5%)	4 (36.3%)	0.5
Focal atrichia	0	0	4 (36.3%)	0.01*
Scalp honeycomb pigmentation	2 (18%)	4 (50%)	9 (81.8%)	0.01*
Multi-hair follicular unit	10 (90.9%)	6 (75%)	3 (37.5%)	0.006*

Brown Perilar Sign

BPPS was seen in 63.6% of cases of FPHL in its early stages, with $P < 0.05$, in our study. A similar result was reported by Ozlem Karadag et al. [12], with BPPS seen in 59.3% of FPHL cases. A study reported by Kibar et al. observed the same findings in the early stages [13].

White Peripilar Sign

WPPS was seen in 63.6% of females with Ludwig stage III in our study. In a study done by Zhang et al. [9], it was observed in 26.7% of FAGA patients in advanced stages. We suppose that this sign was related to perifollicular fibrosis in the late stage of AGA.

Yellow Dots

In our study, yellow dots were found in 36.3% of cases in the late stages of FPHL. Similarly, Hu et al. [11] and Zhang et al. [9] reported that yellow dots were positively related to the severity of the disease. Emina et al. reported 55 (52.88%) of patients with yellow dots seen in both early and advanced stages of the disease [15].

Focal Atrichia (Focal Loss of Hair)

In our study, 36.3% of cases showed a positive correlation with disease severity, similarly to the study by Hu et al. [11], who observed it in 56.5% of FAGA patients in late stages, and in a study by Zhang et al. [9], who observed 56.7% (34/60) of FAGA patients, which correlated with the advancing stage of AGA. In a study reported by Olsen et al., 67% of cases showed focal atrichia in the severe grade of FPHL [16].

Scalp Honeycomb Pigmentation

In our study, it was found in 81.8% in Ludwig's grade III FPHL, whereas in a Chinese study by Hu et al., SHCP was seen in 30.5% of female patients [11] in the late stages of AGA, and a study by Zhang et al. [9] observed it in 61.7% of FAGA patients in late stages.

Multi-hair Follicular Unit

In our study, the multi-hair follicular unit was seen in 10 (90.9%) of cases of grade I, and it decreased with the severity of the disease. Similarly, Emina et al. [15] and Kibar [13] reported the multi-hair follicular unit to decrease with the severity of the disease.

CONCLUSION

Our study has shown the significance of trichoscopy in patients with FPHL as trichoscopy may reveal early changes in hair follicle diameter before hair loss becomes clinically visible. Regular clinical and trichoscopic follow-ups are highly important to monitor disease activity and treatment tolerance.

Statement of Human and Animal Rights

All the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the 2008 revision of the Declaration of Helsinki of 1975.

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