Original research article

A Cross-Sectional study on Trichoscopic Relevance in the Differential Diagnosis of Alopecia in Tertiary Care Center

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Abstract

Background: Alopecia in women is generally difficult to diagnose clinically. Trichoscopy may help make the correct diagnosis in doubtful cases. **Objective**: The aims of the study were to assess the trichoscopic features of different types of alopecia in women, the reliability of trichoscopy vis-à-vis clinical findings, and the validity of trichoscopy in cases with a doubtful clinical diagnosis. **Material & Methods**: A hospital-based observational, cross-sectional study was carried out on women patients with alopecia. A trichoscopic diagnosis was made and correlated with a clinical diagnosis. The validity of trichoscopy in doubtful cases was evaluated by reporting the sensitivity, specificity, positive predictive value, negative predictive value, and diagnostic value. **Results**: A total of 80 patients were recruited including 38 men and 42 women. The mean age at presentation was 26.84 years (range: 10–59 years). Sixty patients had non-cicatricial alopecia and the remaining 20 had cicatricial alopecia. The most common trichoscopic findings were yellow dots (50 patients, 62.5%) and thin hair (33 patients, 41.25%). In patients with alopecia areata, the most frequent findings were yellow dots (92.3%), black dots (68.2%) and exclamation mark hair (72.3%) and Villous Hair (62%). The most common finding in telogen effluvium (TE) was thin hair which was seen in 65.2% of patients. **Conclusion**: We conclude that trichoscopy is a relevant investigation in patients with alopecia and has a definite role in the diagnosis of difficult cases. Trichoscopy helped reach a definitive diagnosis in patients in whom the clinical diagnosis was doubtful.

Keywords : Telogen Effluvium, Trichoscopy, Alopecia, CAGR

Introduction

Hair loss is a common encounter in dermatology practice affecting person's looks. Hair loss may be seen as a failure to conform to the norms of physical appearance within society.(1) With changing trends in the youth the Indian Hair Care Market is forecasted to reach USD 4.89 billion by 2025 growing at a CAGR of 6.58% during the forecast period (2020 - 2025).(2)This growth in hair care market indicates the burden of hair loss affecting all age groups. To aid in reducing this problem accurate diagnosis of alopecia plays a pivotal role. Scalp biopsy and histopathology is the most definitive way of diagnosing alopecia which can be alternated with a non invasive tool called trichoscope. Trichoscope has also an added advantage of helping localize the best site to be biopsied if required.(3)

Trichoscopy term was coined by Lidia Rudnicka and Malgorzata Olszewska in 2006 meaning dermoscopy of hair and the scalp.[4] For scalp examination, a manual dermoscope (×10 magnifi cation) or a videodermoscope with lenses ranging from ×20 to ×1000 magnification can be used.[1,3] In this study trichoscopic features of different alopecias and its diagnostic ability as a non invasive tool in alopecia is being evaluated.

Material and Method:

An observational, cross sectional study carried out for 12 months May 2020 to March 2021.in a hospital setting on patients who visited Department of dermatology **Government Medical College, Aurangabad** OPD with complaint of alopecia. In this study, alopecia was defined as visible thinning or loss of hair from the scalp. Institutional ethical clearance was obtained prior to the study, and written informed consent was received from each participant or their parent/guardian in the case of minors. For each day, a random number (n) was generated by the RANDBETWEEN function in Microsoft Excel. The nth patient received an explanation of the aims and objectives of the study and, after providing proper consent, was included in the study. The study included all patients of all age groups who gave consent for participation in the study.

Two dermatologists independently assessed each patient clinically as well as with a hand lens (×4), recorded the history and examination findings on a proforma and made a diagnosis.. Standard textbook criteria were followed while making a diagnosis. Trichoscopy was performed with a nonpolarized Heine delta 20 mini dermoscope (10× magnification) using liquid paraffin as the contact medium. The center and periphery of the alopecic patch were examined by trichoscopy and photographs taken using an 8MP Samsung S2 camera (3264 × 2448 pixels, autofocus, LED flash) without and with 4x magnification.

Sample Size : Exact overall prevalence of trichospy is unknown, so we have consider only 80 patients.

Statistical Analysis : Data entry of collected was done in Microsoft excel software of MS office 2016, for further analysis of data, entered data was analyzed by using statistical software Statistical Packages for Social Sciences (SPSS) Version 25. Data comprised of Qualitative and Quantitative data, Qualitative data was presented by frequency and proportion and quantitative data was presented in mean and standard deviation. Association between the categorical variable were done by using chi-square test or Fisher exact test, $P < 0.05$ was considered significant at 5% level of Signficance.

Results :

A total of 80 patients were recruited including 38 men and 42 women. The mean age at presentation was 26.84 years (range: 10–59 years). Sixty patients had non-cicatricial alopecia and the remaining 20 had cicatricial alopecia. The demographic and trichoscopic findings of each type of alopecia are shown in Table 1.

The most common trichoscopic findings were yellow dots (50 patients, 62.5%) and thin hair (33 patients, 41.25%). In patients with alopecia areata, the most frequent findings were yellow dots (92.3%), black dots (68.2%) and exclamation mark hair (72.3%) and Villous Hair (62%). The most common finding in telogen effluvium (TE) was thin hair which was seen in 65.2% of patients. The patient with chronic telogen effluvium showed yellow dots, some coiled hair and a honeycomb pigment network. Thin hair were not seen, in contrast to acute telogen effluvium. The most common trichoscopic findings in trichotillomania were broken hair of different lengths (96%) and black dots (92%). Yellow Dots (100%), Villious Hair (100%), Thin Hair (100%), Diameter Diversity (100%), Hony Comb Network (100%), Short Tip Regrwothing (100%), Pig Tail (100%) were the most common trichoscopic findings in congenital alopecia

Study observed various substantial overlap in the trichoscopic findings of the various alopecias. We attempted to isolate those features that were significantly associated with a

particular diagnosis. Comparisons were made between scarring and non-scarring groups as a whole and also among specific diagnostic groups which were easily confused clinically. The statistically significant findings in each group are shown in Table 2.

Table 1 : Trichoscopic and Demographic feature in various type of alopecia

Type of Alopecia	Number of Patients	Male: Female	Median Age (years)	Median Duration (Months)	Common Trichoscopic Findings
Alopecia areata	27	11:16	19.62	5	Yellow dots (92.3%), black dots (68.2%), exclamation mark hair (72.3%), vellius hair (62%), thin hair (32.2%)
Androgenetic alopecia	21	21:00	23.12	25	Yellow dots (95.6%), thin hair (86.3%), vellus hair (42.3%), honeycomb pigment network (43.2%), peripilar sign (12%)
Female Pattern Hair Loss	12	0:12	29.32	42	yellow dots (66.7%), Diameter diversity>20% (79.3%), thin hair (56.2%), vellus hair (25.3%), honeycomb pigment network (15.23%), peripilar sign (9.2%)
Tilogen Effluvim	9	4:05	27	3	Thin hair (65.2%), yellow dots (35.6%), yellow brown dots (18.2%), short tip regrowing hair (14%), peripilar erythema (10%)
Lichen Planopilaris	14	4:10	25	23	honeycomb pigment network (80.3%), Loss of follicles (87.3%), blue grey dots in targetoid pattern (62.3%), white dots (60.25%), yellow dots (60%), peripilar scaling (54.2%), crust formation (20.1%), peripilar erythema (14.2%), peripilar casts (9.23%), cadaverized hair (5.3%), amorphous yellow hair (5.3%), tubular yellow scaling (5.28%)
Trichotillomania	8	3:05	16	52	Broken hair (96%), black dots (92%), split ends (85%), frayed hair (80%), cadaverized hair (74%), follicular hemorrhage (70%), yellow dots (64%), coiled hair (42%), thin hair (31.23%), honeycomb pigment network (12%)
Conginental alopecia	2	2:00	22	21	Yellow Dots (100%), Villious Hair (100%), Thin Hair (100%), Diameter Diversity (100%), Hony Comb Network (100%), Short Tip Regrwothing (100%), Pig Tail (100%)
Tinea Capitis	6	2:04	11	3	Comma Hair (98.3%), Honey Comb Network (83.3%), Yellow Dots (66.7), Black Dots (50%), Thin Hair (50%), Villous Hair (16.7%), Peripilar Sign (16.7%), Short tip regrowthing (33.3), Empty Follicle (33.3%), Peripillar Scaling(33.3)

Table 2 : Association between different type of alopecies

Groups	Significant Findings
Alopecia areata versus trichotillomania	Broken hair of different lengths (P<0.001), frayed hair (P<0.001), split ends (P<0.001) in favor trichotillomania
Alopecia areata versus Conginental alopecia	Villius Hair (P<0.001), Thin Hair (p=0.004)
Alopecia areata versus tinea capitis	Exclamation mark hair (P=0.0023), Comma hair (P<0.05)

Discussion

Our study focused on identifying the role of trichoscopy in alopecia. The findings in each group were in accordance with those already described in the literature.

In our study most common alopecia observed was Alopecia areata which were 34 cases of them, yellow dots, representing distended follicular orifices filled with keratin, were found in 93.3% of cases (1, 2). These correlate with disease severity (3, 4, 5). Black dots, formed when pigmented hair is broken at the scalp level, were seen in 68.2% of cases. Exclamation-mark hairs, representing broken hairs with frayed thicker distal ends and thinner proximal shafts, were seen in 72.3% of cases (6). vellus hair (representing the gradual shortening of hairs follicular miniaturization) were observed (7, 8).

In present study second most common alopecia was androgenetic alopecia, in which yellow dots, hair shaft diameter diversity and thin hair were the prominent features. Inui *et al*.[2] evaluated 50 Asian men with androgenetic alopecia and found hair shaft diameter variation of more than 20% in all the patients. Peripilar sign was positive in 66.6% compared to 12% in our study, possibly owing to the difficulty in identifying this feature in dark skin.

In our study, 66.7% of cases with Female pattern Hair Loss showed Yellow dots, corresponding to follicular ostia filled with sebaceous material, (9, 10). the peripilar sign, a brown depressed halo of approximately 1 mm diameter at the follicular opening that correlates with perifollicular inflammation, although it may be difficult to identify in dark skin our findings were comparable with most of the criteria set by the authors (11).

In present study Trichotillomania, the most common findings were broken hair of unequal length, black dots, split ends, fryed hair, cadaverized hair, follicular hemmorrhage, yellow dots, coiled hair and thin hair. Most of these signs are evidence of hair pulling (12). Hair powder occurs due to the complete destruction of the hair shaft from mechanical trauma (13, 14).

There 6 case of of tinea capitis where comma hair was seen on trichoscopy. Comma hairs are broken single hair shafts that curl into a comma-like structure due to the bending of a hair shaft secondary to hair ectothrix parasitation (15, 16).

In our study, trichoscopy helped to reach a conclusive diagnosis in 86% of the 25patients in whom the diagnosis was not clear. Trichoscopy is a valuable investigation in patients with alopecia and has a definite role in the diagnosis of difficult cases.

Limitation

For some types of alopecia comparative analysis was restricted due to small number of samples in each group. Some patients had been earlier treated elsewhere and treatment could have

modified the trichoscopic findings. the validity parameters could not be calculated in all types of alopecia, with scalp biopsy the gold standard for comparison. Biopsies were not performed in every patient as the diagnosis was evident clinically in many patients and an invasive procedure seemed unwarranted.

Conclusion

We conclude that trichoscopy is a relevant investigation in patients with alopecia and has a definite role in the diagnosis of difficult cases. Trichoscopy provides quick detection of scalp and hair disorders with advanced diagnostic accuracy, predicts the course of the disease, and decreases the need for unnecessary biopsies.

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