ORIGINAL RESEARCH

Dermatological study of trichoscopy in the differential diagnosis of alopecia in tertiary care center

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ABSTRACT
Background: Hair loss is a frequent complaint, diseases that result in hair loss lead to low self-esteem and impaired psychosocial interactions. Present study was aimed to study trichoscopic relevance in the differential diagnosis of alopecia in tertiary care center.
Material and Methods: Present study was single-center, a cross‑ sectional observational study, conducted in patients attending dermatology OPD, with complaint of hair loss.
Results: In present study, 228 patients of alopecia were studied. Majority were from 21-30 years age group (29.82 %) followed by > 41 years age (25.88 %) & 31-40 years age (21.49 %). Male patients (65.35 %) were more than female (34.65 %). Among patients of Androgenetic alopecia (male) (66 cases), common trichoscopic findings were yellow dots (100.00 %), diameter diversity>20% (96.97 %), thin hair (93.94 %), vellus hair (54.55 %) & honeycomb pigment network (25.76 %). In patients of female pattern hair loss (41 cases), common trichoscopic findings were diameter diversity>20% (85.37 %), thin hair (73.17 %), yellow dots (39.02 %), vellus hair (26.83 %) & honeycomb pigment network (14.63 %). Among patients of alopecia areata (52 cases), common trichoscopic findings were yellow dots (88.46 %), black dots (82.69 %), exclamation mark hair (65.38 %), vellus hair 53.85 %) & thin hair (42.31 %). In patients of telogen effluvium (45 cases), common trichoscopic findings were thin hair (77.78 %) & yellow dots (44.44 %).
Conclusion: Along with clinical and histopathological findings, trichoscopy is valuable, noninvasive, useful, low‑ cost technique & relevant investigation in the differential diagnosis of alopecia.
Keywords: trichoscopy, alopecia, dermoscopy, hair disorders

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INTRODUCTION
Hair loss is a frequent complaint, diseases that result in hair loss lead to low self-esteem and impaired psychosocial interactions. Alopecia is defined as complete or partial loss of hair from the scalp and other hair‑ bearing sites of the body. Alopecia has been classified into scarring and nonscarring alopecia and hair shaft disorders.[1]
The methods most commonly used to diagnose hair loss disorders include visual inspection, hair pull test, and biopsy, which is an invasive method. The need of noninvasive methods is growing in clinical practice and thereby trichoscopy.[2] Trichoscopy is the dermoscopic

examination of the hair and scalp. It is a fast, noninvasive, and cost-efficient technique that improves diagnostic accuracy and follow-up with hair and scalp disorders.[3]

The scalp biopsy was once considered an ideal tool for diagnosing the disease, though trichoscopy has emerged as a reliable technique that can aid in the diagnosis and monitor the disease severity. Present study was aimed to study trichoscopic relevance in the differential diagnosis of alopecia in tertiary care center.

MATERIAL AND METHODS

Present study was single-center, a cross‑ sectional observational study, conducted in Department of Dermatology, Venereology & Leprosy, Mamata Medical College, Khammam, India. Study duration was of 1 year (January 2021 to December 2021). Institutional Ethical Committee clearance was obtained prior to start of study.

Inclusion criteria

● Patients attending dermatology OPD, with complaint of hair loss, willing to participate in present study

Exclusion criteria

● Uncooperative patients
● Patients with active secondary bacterial infection in the alopecic patch

Study was explained to patients in local language & written consent was taken for participation & study. Patients demographic details, complaints, past history, clinical and dermatological examination findings were noted in predesigned proforma. Clinical differential diagnosis was made on basis of history & clinical examination as per standard textbook criteria.

Investigations such as potassium hydroxide were done in suspected cases of tinea capitis, biopsy in doubtful cases of nonscarring and scarring alopecia. Hair microscopy in hair shaft disorders. In OPD, hair and scalp were evaluated using a trichoscope (Dermlite, 3Gen LLC, Sanjuan Capistrano, CA, USA) with $\times$ 10 and polarized filters for follicular and interfollicular patterns. Dermoscopic photographs were taken for further correlation.

Data was collected and compiled using Microsoft Excel, analysed using SPSS 23.0 version. Statistical analysis was done using descriptive statistics.

RESULTS

In present study, 228 patients of alopecia were studied. Majority were from 21-30 years age group (29.82 %) followed by > 41 years age (25.88 %) & 31-40 years age (21.49 %). Male patients (65.35 %) were more than female (34.65 %).

Table 1: Age and gender distribution

Age (years)	No. of patients (n=228)	Percentage
<10	15	6.58%
11-20	37	16.23%
21-30	68	29.82%
31-40	49	21.49%
>41	59	25.88%
Sex		
Male	149	65.35%
Female	79	34.65%

Androgenetic alopecia (Male - 28.95 %, Female- 17.98 %) was most common diagnosis among study patients, followed by alopecia areata (22.81 %), telogen effluvium (19.74 %), lichen planopilaris (3.07 %), tinea capitis (3.07 %), trichotillomania (2.19 %) & discoid lupus erythematosus (2.19 %).

Table 2: Final Diagnosis

Diagnosis	No. of patients (n=228)	Percentage
Androgenetic alopecia (AGA)		
· Male	66	28.95%
· Female	41	17.98%
Alopecia areata (AA)	52	22.81%
Telogen effluvium	45	19.74%
Lichen planopilaris	7	3.07%
Tinea capitis	7	3.07%
Trichotillomania	5	2.19%
Discoid lupus erythematosus (DLE)	5	2.19%

Among patients of Androgenetic alopecia (male) (66 cases), common trichoscopic findings were yellow dots (100.00 %), diameter diversity>20% (96.97 %), thin hair (93.94 %), vellus hair (54.55 %) & honeycomb pigment network (25.76 %). In patients of female pattern hair loss (41 cases), common trichoscopic findings were diameter diversity>20% (85.37 %), thin hair (73.17 %), yellow dots (39.02 %), vellus hair (26.83 %) & honeycomb pigment network (14.63 %).

Among patients of alopecia areata (52 cases), common trichoscopic findings were yellow dots (88.46 %), black dots (82.69 %), exclamation mark hair (65.38 %), vellus hair 53.85 %) & thin hair (42.31 %). In patients of telogen effluvium (45 cases), common trichoscopic findings were thin hair (77.78 %) & yellow dots (44.44 %).

In patients of lichen planopilaris (7 cases), common trichoscopic findings were loss of follicles (100.00 %), white dots (85.71 %), honeycomb pigment network (71.43 %) & blue grey dots in targetoid pattern (42.86 %), Among patients of tinea capitis (7 cases), common trichoscopic findings were comma hair (100.00 %), cadaverized hair (85.71 %), coiled hair (57.14 %), hemorrhagic spots (42.86 %), honeycomb pigment network (42.86 %) & yellow dots (42.86 %).

Among patients of DLE (5 cases), common trichoscopic findings were loss of follicles (80 %), white areas (80 %), arborizing red loops (60 %), peripilar erythema (60 %) & follicular plugging (40 %). Among patients of trichotillomania (5 cases), common trichoscopic findings were broken hair (100 %), black dots (100 %), split ends (80 %), frayed hair (80 %), cadaverized hair (60 %), follicular hemorrhage (60 %), yellow dots (60 %) & coiled hair (40 %).

Table 3: Trichoscopic findings

Type of alopecia	Trichoscopic findings	No. of patients	Percentage
Androgenetic alopecia (male) (66 cases)	Yellow dots	66	100.00%
	Diameter diversity>20%	64	96.97%
	Thin hair	62	93.94%
	Vellus hair	36	54.55%
	Honeycomb pigment network	17	25.76%
Female pattern hair loss (41 cases)	Diameter diversity>20%	35	85.37%
	Thin hair	30	73.17%

	Yellow dots	16	39.02%
	Vellus hair	11	26.83%
	Honeycomb pigment network	6	14.63%
Alopecia areata (52 cases)	Yellow dots	46	88.46%
	Black dots	43	82.69%
	Exclamation mark hair	34	65.38%
	Vellus hair	28	53.85%
	Thin hair	22	42.31%
Telogen effluvium (45 cases)	Thin hair	35	77.78%
	Yellow dots	20	44.44%
Lichen planopilaris (7 cases)	Loss of follicles	7	100.00%
	White dots	6	85.71%
	Honeycomb pigment network	5	71.43%
	Blue grey dots in targetoid pattern	3	42.86%
Tinea capitis (7 cases)	Comma hair	7	100.00%
	Cadaverized hair	6	85.71%
	Coiled hair	4	57.14%
	Hemorrhagic spots	3	42.86%
	Honeycomb pigment network	3	42.86%
	Yellow dots	3	42.86%
DLE (5 cases)	Loss of follicles	4	80.00%
	White areas	4	80.00%
	Arborizing red loops	3	60.00%
	Peripilar erythema	3	60.00%
	Follicular plugging	2	40.00%
Trichotillomania (5 cases)	Broken hair	5	100.00%
	Black dots	5	100.00%
	Split ends	4	80.00%
	Frayed hair	4	80.00%
	Cadaverized hair	3	60.00%
	Follicular hemorrhage	3	60.00%
	Yellow dots	3	60.00%
	Coiled hair	2	40.00%

DISCUSSION

Trichoscopy is evolving as an indispensable aid to the dermatologist by providing valuable clues on dermatoscopy of the scalp and hair. Trichoscopy presents as a bridging tool between clinical and histological diagnosis.[5] A brown, depressed halo at the follicular opening can be observed in early androgenetic alopecia and yellow dots can be seen in advanced cases. Further, a honeycomb-pigmented appearance can be appreciated in sun-exposed regions of the scalp.[6]

Komalpreet K et al.,[7] studied 68 patients (38 males and 30 females), hair thickness heterogeneity was the most common dermatoscopic feature seen in all the patients of male and female pattern hair loss. There was a positive correlation between some dermatoscopic

variables such as yellow dots and perifollicular pigmentation with the disease severity. Yellow dots were seen in the late stages of AGA ($P < 0.01$), while perifollicular pigmentation was observed in the early stages of AGA ($P < 0.01$).

In study by Salahudeen M et al,[9] out of 200 cases, 92 cases (46%) were of androgenetic alopecia, 70 cases (35%) were alopecia areata, 36 cases (18%) were telogen effluvium and 2 cases had both androgenetic alopecia and alopecia areata. Hair diameter diversity was observed in all cases of androgenetic alopecia with peripilar sign being the most frequent findings. In alopecia areata, the most common findings were black dots (51.4%) followed by broken hair (31.4%) and yellow dots (30.0%). In telogen effluvium, one follicular hair unit and empty hair follicles were seen in all cases.

Mamatha P et al.,[9] studied 256 patients, 154 were male and 102 were female. Most of the cases were in the age group of 21–40 years (66.4%). Nonscarring alopecias (93.35%) were common compared to scarring alopecias (5.8%). The most common alopecia noted in our study was Androgenetic alopecia 125 patients (48.82%), followed by telogen effluvium 48 patients (19.1%), the common trichoscopic follicular features noted were short vellus hair 161 (62.8%), yellow dots (61%), hair diameter variation 125 (48.82%), and black dots (21.87%). The commo interfollicular features are seen were arborizing vessels 109 (42.6%) and pigmentation in 12 patients (4.68%). Significant findings observed in each group were hair diameter diversity in androgenetic alopecia, exclamatory mark in Alopecia Areata, comma hair in tinea capitis. Cicatricial alopecias are characterized by loss of follicular ostia along with inflammatory signs such as perifollicular scales and casts.

Chiramel MJ et al., studied 120 patients of alopecia, yellow dots (63.3%) were the most common trichoscopic feature followed by thin hair (40.8%). Among the 21 difficult cases of alopecia, trichoscopy was diagnostic in 19 (90.5%). Statistically significant features on intergroup comparison included black dots (Fischer's exact test, $P < 0.001$), cadaverized hair ($P = 0.024$), exclamation mark hair ($P < 0.001$) in alopecia areata; diameter diversity more than 20% ($P < 0.001$) and thin hair ($P < 0.001$) in androgenetic alopecia; broken hair of different lengths ($P < 0.001$), frayed hair ($P < 0.001$), split ends ($P < 0.001$) in trichotillomania; comma hair ($P < 0.001$) in tinea capitis and arborizing blood vessels in discoid lupus erythematosus ($P = 0.012$).

Varma K et al., studied 269 patients of alopecia, 173 (64.3%) males and 96 (35.7%) females. 45.4% patients were diagnosed to have alopecia areata in which yellow dots were the most common trichoscopic finding observed in 88.5% patients. 37.2% patients were diagnosed with androgenetic alopecia with hair diameter diversity >20% observed in all the patients. 9.3% patients were diagnosed to have telogen effluvium with short vellus hair seen in 64% patients. 3.7% of the patients were diagnosed to have seborrheic dermatitis with arborizing vessels being the most common finding seen in 90% patients. 2.9% patients were diagnosed with lichen planopilaris in which loss of follicles and peritubular white casts were seen in all the cases. 0.9% patients were diagnosed to have discoid lupus erythematosus with hyperkeratotic follicular plugging seen in all the cases. Overall yellow dots were the most common trichoscopic findings seen in 61% cases.

For the algorithm for cicatricial alopecia, loss of orifices, micropustules and/or hair tufting with six or more hairs should be carefully observed. When loss of hair orifices cannot be seen in the hair loss area, diagnosis as noncicatricial alopecia is established. Among noncicatricial alopecia, alopecia areata is commonly encountered and should be mainly considered for differential

diagnosis. Therefore, the first check point is yellow dots, black dots or broken hairs. The hallmark of androgenetic alopecia and tinea capitis is hair diameter diversity (≥20%) and comma hairs, respectively.[12] Miteva et al. concluded that trichoscopy and videodermoscopy were very useful in differentiating non‑ scarring from scarring alopecia and alopecia areata from other patchy alopecias, as well as in diagnosing early androgenetic alopecia and tinea capitis.[13] Trichoscopy is a simple and non-invasive office tool that aids in diagnosing AGA. It allows the various sections of hair to be examined simultaneously and obviates the need for a scalp biopsy. Besides this, it helps assess the disease severity and the photographic documentation at each visit helps monitor the response to treatment.

CONCLUSION

Along with clinical and histopathological findings, trichoscopy is valuable, noninvasive, useful, low‑ cost technique & relevant investigation in the differential diagnosis of alopecia.

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