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Trichoscopy in alopecia areata

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Abstract
Introduction: The term "Trichoscopy" was coined in 2006 by Lidia Rudnicka and Malgorzata Olszewska and it was coined for dermoscopy of hair and scalp. On the basis of permanent damage to the hair follicles, hair loss can be cicatricial or scarring and non-cicatricial or non-scarring. The primary conditions which constitute non-cicatricial alopecia are Androgenetic alopecia [AGA], Alopecia areata [AA], Telogen effluvium [TE]. Non-scarring alopecias, are more amenable to treatment and will be the objects of this study, particularly AA.
Material and Methods: It is a cross-sectional and observational study is suited for estimating the prevalence of each trichoscopic feature in AA. The study was conducted in the Department of Dermatology, Venereology and Leprosy, Subbaiah Institute of Medical Sciences, Shimoga, Karnataka. The study was conducted between January 2020 to December 2020 with sample size of 100 patients.
Results: In the 100 cases of AA, 95% had Patchy Alopecia Areata (PaAA), 2% had Alopecia Universalis (AU), 1% had Alopecia Totalis (AT) and 2% had Ophiasis pattern of AA. Hair pull test was positive in 14 patients (14%) and 61 patients (61%) had positive hair pull test at the periphery of the patches. The common trichoscopic features were black dots (66%), yellow dots (62%) and empty hair follicles (19%). The characteristic hair patterns were broken hair (81%), exclamation mark hair (87%) and vellus hair (43%).
Conclusion: This study showed that among 100 patients AA, the most prevalent subtype is PaAA. Maximum number of patients were in the age group of 21 – 30 years. The characteristic follicular features of AA on Trichoscopy were black dots, yellow dots and empty hair follicles. The characteristic hair patterns were broken hair, exclamation mark hair, vellus hair.

Keywords: Dermoscopic findings of scalp, non-cicatricial alopecia, alopecia areata

Introduction

Hair style, a characteristic of human beings is a mark of health and represents identity and ethnic group of a person. One's quality of life can be seriously affected by hair loss [1].

On the basis of permanent damage to the hair follicles, hair loss can be cicatricial or scarring and non-cicatricial or non-scarring. The primary conditions which constitute non-cicatricial alopecia are Androgenetic alopecia [AGA], Alopecia areata [AA], Telogen effluvium [TE], of which AGA is the commonest [2]. Trichotillomania, Anagen effluvium, Drug induced alopecia, Tractional alopecia, alopecia caused by systemic disorders, Viral, bacterial, fungal infections of the scalp are other causes of non-scaring alopecia [3]. The development of new hair follicles following birth, barring a few exceptions is not a possibility. Therefore, in spite of treating the underlying pathology, patches of scarring alopecia do not show re-growth of hair. Non-scarring alopecias, on the other hand are more amenable to treatment and will be the objects of this study, particularly, AA. A patient suffering from hair loss is evaluated by several methods.

Dermoscopy, also known as Epiluminescence microscopy, or Skin surface microscopy is a non-invasive, *in-vivo* technique, most commonly used for viewing pigmented skin lesions [4]. The term "Trichoscopy" was coined in 2006 by Lidia Rudnicka and Malgorzata Olszewska and it was coined for dermoscopy of hair and scalp [5].

The dermoscope suitable for scalp examination is a manual dermoscope (x 10 magnification) or a video dermoscope [6] (x 20 to x 1000 magnification). The manual dermoscopes which are available are contact dermoscopes. They require an interface solution, like alcohol or oil. Videodermoscopy, on the other hand do not require interface solution.

They have three modes-Ultraviolet light (UV), Polarized light (PL) and White light (WL) [4]. Trichoscopic evaluation of the scalp is done on the basis of follicular patterns,

Interfollicular patterns and hair signs [4]. Any condition affecting the scalp will have characteristic patterns, based on which diagnosis of the particular condition can be made.
Trichoscopy is an important tool to detect AA and it can be used as a prognostic tool as well. In this study, we will outline the characteristic trichoscopic findings of the same.

Material and Methods

It is a cross-sectional and observational study is suited for estimating the prevalence of each trichoscopic feature in AA. The study was conducted in the Department of Dermatology, Venereology and Leprosy, Subbaiah Institute of Medical Sciences, Shimoga, Karnataka. The study was conducted between January 2020 to December 2020 with sample size of 100 patients. Based on previous records of patients having Alopecia Areata who had attented the outpatient department of Dermatology, Venereology and Leprosy in the previous year.

Inclusion criteria

All consenting male and female patients, with alopecia areata.

Exclusion criteria

Patients having scarring alopecia or alopecia secondary to drugs and external injury were excluded from the study. Patients having non-cicatricial alopecia other than Alopecia Areata were also excluded from the study.

Data collection

A detailed history regarding the age, sex, occupation, family history, personal habits, duration of the disease and history of previous treatment was taken. Clinical photographs of the lesions were taken. Dermatological and systemic examination was carried out. Diagnosis of Alopecia areata was made on clinical examination and by performing Hair pull test.
The alopecias were graded/classified corresponding to the type of alopecia. Alopecia areata was classified as Patchy AA, Ophiasis AA, Alopecia Totalis and Alopecia Universalis. Dermoscopic/Trichoscopic examination of the scalp and hair was performed using a video dermatoscope (Dermaindia) which is a non-contact dermatoscope providing 50X and 200X magnification. The areas that were examined in cases of alopecia areata; the center and periphery of the bald patch. The data was noted in a pre-tested and pre-designed proforma after taking informed and written consent.

Statistical method for data analysis

Percentages were used to determine the prevalence of each trichoscopic feature in AA. Chi square test was used wherever applicable.

Results

In the 100 cases of AA, 95% had Patchy Alopecia Areata (PaAA), 2% had Alopecia Universalis (AU), 1% had Alopecia Totalis (AT) and 2% had Ophiasis pattern of AA.

Table 1: Prevalence of hair pull test

Clinical diagnosis	Present	P%	Present at periphery	PaP%
AA	14	14%	61	61%

Hair pull test was positive in 14 patients (14%). Hair pull test was positive at the periphery of the lesion in 61 patients (61%) of patients with AA.

Table 2: Prevalence of yellow dots

Clinical diagnosis	Present	P%
PaAA	59	62%
AU	2	100%
AT	1	100%
Ophiasis pattern	2	100%

The above data suggests that yellow dots are present in high frequency in all subtypes of AA.

Table 3: Prevalence of black dots

Clinical diagnosis	Present	P%
PaAA	62	66 %
AU	2	100%
AT	1	100%
Ophiasis pattern	2	100%

The above data suggest that black dots is most commonly present in AA (66%).

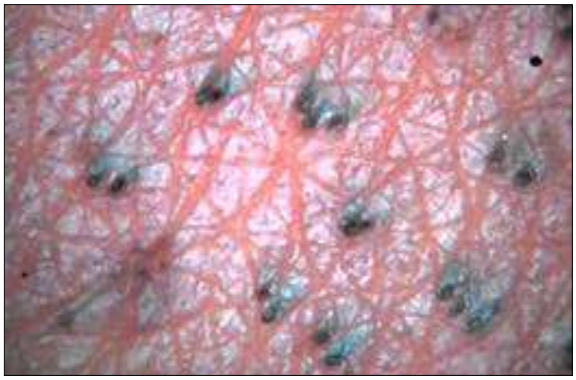

Fig 1: Black dots in AA

Table 4: Prevalence of empty hair follicles

Clinical diagnosis	Present	P%
PaAA	18	19%
AU	2	100%
AT	1	100%
Ophiasis pattern	2	100%

The above data suggests that empty hair follicles are present in increasing frequencies in AT, AU and Ophiasis pattern of AA.

Table 5: Prevalence of broken hair

Clinical diagnosis	Present	P%
PaAA	76	81.00%
AU	1	50%
AT	0	0
Ophiasis pattern	0	0

The above data suggests that broken hair is present in 81% of patients with AA.

Table 6: Prevalence of exclamation mark hair

Clinical diagnosis	Present	P%
PaAA	52	57%
AU	1	50%
AT	1	100%
Ophiasis pattern	1	50%

Fig 2: Broken hair and exclamation mark hair in AA

The above data suggest that Exclamation mark hair is present predominantly in PaAA (57%) and in AU, AT and Ophiasis pattern in varying frequencies.

Table 7: Prevalence of Vellus hair

Clinical diagnosis	Present	P%
PaAA	39	43%
AU	1	50%
AT	1	100%
Ophiasis pattern	1	50%

The above data suggest that vellus hair is present in increasing frequency in PaAA (43%) and with varying frequencies in AU, AT and Ophiasis pattern.

Table 8: Prevalence of upright re-growing hair

Clinical diagnosis	Present	P%
PaAA	22	23%
AU	1	50%
AT	1	100%
Ophiasis pattern	0	0

The above data suggest that upright re-growing hair can be present in PaAA (23%) and depends on the stage and duration of treatment.

Table 9: Prevalence of pigtail hair

Clinical diagnosis	Present	P%
PaAA	26	29%
AU	0	0
AT	0	0
Ophiasis pattern	0	0

The above data suggests that pigtail hair is specifically found in PaAA (29%) in this study.

Table 10: Prevalence of zigzag hair

Clinical diagnosis	Present	P%
PaAA	18	19.00%
AU	0	0
AT	1	100%
Ophiasis pattern	0	0

The above data suggest that zigzag hair is specifically found in PaAA and AT.

Table 11: Prevalence of Monilethrix-like hair

Clinical diagnosis	Present	P%
PaAA	23	25%
AU	0	0
AT	0	0
Ophiasis pattern	0	0

Monilethrix-like hair was present in 23 (25%) patients of PaAA.

Discussion

Dermoscopy has received considerable interest in the recent years, with special consideration to Trichoscopy. Various instruments are being used for Trichoscopy i.e. non-contact and contact. The trichoscopic findings in alopecias has not yet been standardized. Hence, this study has been done to detect the most common trichoscopic features in Alopecia Areata. Here we have compared the present study with a few related studies.

In the present study, 95 patients had PaAA. Whereas, in the study done by Vivek V Nikam and Hita H Mehta, [7, 8] 25 of the patients had AGA, 32 of the patients had AA and the rest were those of cicatricial alopecia. In the study by Balachandra Ankad, *et al*., all the 50 patients studied were those of AA, hence giving the trichoscopic observations in this study more weightage for this particular alopecia [9]. In the study by Abd-Elaziz El-Taweel, *et al*., 20 patients of AA were studied [10].

A comparison of prevalence yellow dots in the present study with other studies is presented in the table below. In AA however, the prevalence of yellow dots is comparable to three studies by Balachandra Ankad, *et al*., Abd-Elaziz El-Taweel, *et al*. and Lidia Rudnicka, *et al*. respectively [9-11]. But it varies greately from the values in Vivek V Nikam and Hita H Mehtas' study [7, 8]. This variation may be due to the variation in the trichoscope used for the study and in the sample size.

The prevalence of black dots in AA in the present study is comparable to that of the three studies by Vivek V Nikam and Hita H Mehta, Abd-Elaziz El-Taweel, *et al*. and Lidia Rudnicka *et al*. respectively [10-13]. The present study has listed the findings under the headings of "P" (Present) based on the number of fields they are present in. These variations may be due to the variation in sample size or due to the different instruments used for the study.

The dermoscope used in the present study was not suitable to study interfollicular features like pigment and vascular patterns due to the excessive glare from the white light. Hence no comments can be made about the interfollicular features.

The prevalence of broken hair in AA in the present study is comparable to that of the study done by Abd-Elaziz El-Taweel, et al. [10]. It is, however higher than the prevalence seen in the studies done by Vivek V Nikam and Hita H Mehta and Lidia Rudnicka *et al*. [11-13]. The prevalence of EMH in AA in the present study is similar to that found in the studies be Balachandra Ankad, *et al*., Abd-Elaziz El-Taweel, *et al*. and Lidia Rudnicka, *et al*. [9-11] EMH is absent in AGA as observed in the above studies.

The prevalence of vellus hair in AA in the present study is similar to the findings in the studies done by Vivek V Nikam and Hita H Mehta, Lidia Rudnicka, *et al*. and Abd-Elaziz El-Taweel, *et al*. [10, 12]. It is, however greater than the findings in the study by Balachandra Ankad, *et al*. [9]. This variation can be explained by the diversity in types of AA present in both the studies and the time duration of the disease in the patients enrolled in both the studies.

The prevalence of pigtail re-growing hair in AA in the present study is comparable to that found in the study by Abd-Elaziz El-Taweel *et al*. [12]. The prevalence of monilethrix- like hair in AA in the present study is

comparable to that found in the study by Lidia Rudnicka, *et al*. [10]. Upright re-growing hair in the present study was present in AA (23%). Zigzag hair was observed in AA (19%) in the present study. These features have been mentioned in a study by Lidia Rudnicka, *et al*. [10]. The prevalence, however has not been mentioned.

Conclusion

Hair pull test was positive in 14 patients (14%) and 61 patients (61%) had positive hair pull test at the periphery of the patches.

The characteristic follicular features of AA on Trichoscopy were black dots (19% < 4 fields; 66% > 4 fields), yellow dots (62% < 4 fields; 19% > 4 fields) and empty hair follicles (14% < 4 fields; 19% > 4 fields). The characteristic hair patterns were broken hair (80% < 4 fields; 10% > 4 fields), exclamation mark hair (87% < 4 fields), vellus hair (43% < 4 fields), pigtail re-growing hair (29% < 4 fields), upright re-growing hair (23% < 4 fields), zig-zag hair (19% < 4 fields) and monilethrix-like hair (10% < 4 fields).

The dermoscope used in the present study was not suitable to study interfollicular features like pigment and vascular patterns due to the excessive glare from the white light. Hence no comments can be made about the interfollicular features. Perhaps, more studies with larger sample size and better dermoscopes will help to standardize the trichoscopic findings in different types of alopecias.

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