



Original Article

Trichoscopic Findings in Alopecia Areata - A Cross Sectional Study

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ABSTRACT

Background: Alopecia areata (AA) is an autoimmune, non-scarring hair loss disorder with variable clinical presentations. Trichoscopy is a non-invasive tool that aids in diagnosis, assessment of disease activity, and prognosis. The present study was conducted To evaluate the trichoscopic features in patients with AA and assess their association with disease activity and clinical patterns.

Materials and Methods: This cross-sectional study included 50 patients with clinically diagnosed AA. Trichoscopic examination was performed using a dermoscope at 10× magnification, assessing exclamation mark hairs, black dots, yellow dots, broken hairs, and vellus hairs. Associations with disease activity (active vs stable) and clinical pattern (patchy, totalis, universalis) were analyzed using Chi-square tests.

Results: The most common trichoscopic features were yellow dots (84%), black dots (72%), exclamation mark hairs (66%), broken hairs (58%), and vellus hairs (44%). Exclamation mark hairs and black dots were significantly associated with active disease ($\chi^2 = 14.2$, $p = 0.002$; $\chi^2 = 4.8$, $p = 0.028$). Broken hairs also correlated with activity ($\chi^2 = 5.3$, $p = 0.021$). Yellow dots were predominant in chronic/extensive AA ($\chi^2 = 6.81$, $p = 0.033$). Vellus hairs were observed mainly in regrowth areas.

Conclusion: Trichoscopic features provide objective markers of disease activity and chronicity in AA. Exclamation mark hairs and black dots indicate active lesions, yellow dots reflect chronic or extensive disease, and vellus hairs signify regrowth. Trichoscopy is thus valuable for diagnosis, monitoring, and prognostication in alopecia areata.

Keywords: Alopecia areata, Trichoscopy, Exclamation mark hairs, Yellow dots, Black dots, Disease activity.

INTRODUCTION

Alopecia areata (AA) is a chronic, autoimmune, non-scarring hair loss disorder that affects both children and adults, with a lifetime risk of approximately 1–2% worldwide [1,2]. The disease is characterized by well-circumscribed patches of hair loss, which may progress to total scalp involvement (alopecia totalis) or complete body hair loss (alopecia universalis) in severe cases [3]. Although the precise etiology remains unclear, AA is believed to result from autoimmune-mediated attack on anagen-phase hair follicles, leading to hair shaft disruption and follicular miniaturization [4,5]. Genetic predisposition, environmental triggers, and immune dysregulation are all implicated in its pathogenesis [6].

Clinical diagnosis of AA is usually straightforward in typical cases; however, early, subtle, or atypical presentations can pose diagnostic challenges. Differentiating AA from other hair disorders, such as telogen effluvium, trichotillomania, or

scarring alopecias, is important for timely and appropriate management [7]. Traditionally, scalp biopsy has been considered the gold standard for diagnosis, but it is invasive, uncomfortable, and often unnecessary when non-invasive tools can provide sufficient diagnostic information [8].

Trichoscopy, a non-invasive dermoscopic technique, enables in vivo visualization of hair shafts, follicular openings, and perifollicular skin changes at high magnification. This technique allows for early detection of disease activity, differentiation from other hair disorders, and prognostication, without the need for biopsy [9,10]. Key trichoscopic features of AA include exclamation mark hairs, black dots, yellow dots, broken hairs, and short vellus hairs [11–13]. These features have been shown to correlate with disease activity, chronicity, and regrowth potential, making trichoscopy an essential diagnostic and monitoring tool in modern dermatology practice [14,15].

Despite the growing use of trichoscopy in clinical practice, data on trichoscopic patterns in diverse populations remain limited, and few studies have systematically correlated trichoscopic features with disease activity and clinical patterns. This study was therefore conducted to evaluate trichoscopic findings in patients with alopecia areata and to assess the association of these features with disease activity and clinical subtypes.

MATERIALS AND METHODS

Study Design and Setting

This was a **hospital-based cross-sectional study** conducted in the Department of Dermatology at Tertiary care hospital for a period of 6 months. The study protocol was reviewed and approved by the **Institutional Ethics Committee**. Written informed consent was obtained from all participants prior to enrolment.

Study Population

- **Inclusion Criteria:**

1. Patients of all ages and both sexes with **clinically diagnosed alopecia areata**, including patchy AA, alopecia totalis, or alopecia universalis.
2. Patients who provided written informed consent for trichoscopic examination.

- **Exclusion Criteria:**

1. Patients with **scarring alopecia** or other dermatological conditions that could mimic AA (e.g., tinea capitis, trichotillomania).
2. Patients on **systemic immunosuppressive therapy** or topical treatments affecting hair growth in the past 3 months.
3. Patients unwilling to participate or undergo trichoscopic evaluation.

Sample Size

A total of **50 patients** fulfilling the inclusion criteria were enrolled consecutively during the study period. This sample size was considered adequate to identify common trichoscopic patterns and evaluate associations with disease activity.

Clinical Assessment

- Detailed demographic data (age, sex) and clinical history (duration of disease, family history of AA, history of autoimmune disorders) were recorded.
- Disease activity was assessed by **history of new or enlarging patches within the last 6 months**.
- Clinical pattern of AA was classified as:
 - **Patchy AA** – localized, discrete patches
 - **Alopecia totalis** – complete scalp involvement
 - **Alopecia universalis** – total scalp and body hair loss

Trichoscopic Examination

- Trichoscopic examination was performed using a **dermoscope (DermLite DL4 or equivalent) at 10× magnification**, under both polarized and non-polarized light.
- **Sites of examination:**
 - Active patches (recently enlarged or developing)
 - Chronic patches (stable for >6 months)
 - Regrowth zones, when present
- **Trichoscopic features assessed:**
 - 1) **Exclamation mark hairs:** Distal thickening with proximal tapering, indicating active hair follicle damage.
 - 2) **Black dots:** Cadaverized hairs at follicular openings, marker of ongoing follicular damage.
 - 3) **Yellow dots:** Follicular keratin-filled openings, commonly seen in chronic or extensive disease.
 - 4) **Broken hairs:** Short fractured hairs, indicative of mechanical or autoimmune disruption.
 - 5) **Vellus hairs:** Thin, short hairs reflecting early regrowth.

- Findings were **documented photographically** using the dermoscope camera or smartphone adaptor. Each feature was **counted and recorded per patient**, and the percentage of affected follicles was noted when applicable. for cleaning and coding before statistical analysis. Each patient was assigned a unique study ID to maintain confidentiality.

Statistical Analysis: Data were entered into **Microsoft Excel** and analysed using **SPSS version 20**. **Continuous variables** were expressed as **mean $\pm$ standard deviation (SD)**. **Categorical variables** were expressed as **frequencies and percentages**. Associations between trichoscopic features and **disease activity or pattern** were analyzed using **Chi-square test**. A **p-value < 0.05** was considered statistically significant.

RESULTS

A total of 50 patients with alopecia areata were included. The mean age was 28.6 ± 9.4 years, with 56% males and 44% females. The most common clinical pattern was patchy AA (70%), followed by alopecia totalis (20%) and alopecia universalis (10%). Active disease was seen in 60% of patients (Table 1).

Characteristic	Number of Patients (%) or Mean $\pm$ SD
Age (years)	28.6 ± 9.4
Age groups	
– <20 years	10 (20%)
– 20–40 years	30 (60%)
– >40 years	10 (20%)
Sex	
– Male	28 (56%)
– Female	22 (44%)
Duration of Disease (months)	9.2 ± 6.1
Clinical Pattern	
– Patchy AA	35 (70%)
– Alopecia Totalis	10 (20%)
– Alopecia Universalis	5 (10%)
Disease Activity	
– Active (new/enlarging patches within 6 months)	30 (60%)
– Stable/Chronic	20 (40%)
Family History of AA	8 (16%)
History of Autoimmune Disorders	5 (10%)

Exclamation mark hairs and black dots were **strong indicators of active disease**, reflecting ongoing follicular damage. Broken hairs also correlated with active lesions. Yellow dots were more common in stable or chronic patches, while vellus hairs indicated **early regrowth**. These trichoscopic markers provide **objective assessment of disease activity** and can guide clinical monitoring (Table 2)

Table 2: Association of Trichoscopic Features with Disease activity

Feature	Active AA (%)	Stable AA (%)	p-value
Exclamation mark hairs	26/30 (86.7%)	7/20 (35%)	0.002
Black dots	25/30 (83.3%)	11/20 (55%)	0.028
Yellow dots	24/30 (80%)	18/20 (90%)	0.317
Broken hairs	20/30 (66.7%)	9/20 (45%)	0.021
Vellus hairs	12/30 (40%)	10/20 (50%)	0.438

Patchy AA shows higher prevalence of **exclamation mark hairs and black dots**, markers of active disease. **Alopecia totalis and universalis** show predominance of **yellow dots**, reflecting chronicity and follicular inactivity (Table 3).

Table 3: Association of Trichoscopic Features with Clinical Pattern in Alopecia Areata

Trichoscopic Feature	Patchy AA (n = 35)	Alopecia Totalis (n = 10)	Alopecia Universalis (n = 5)	p-value
Exclamation mark hairs	26 (74%)	4 (40%)	3 (60%)	0.077
Black dots	24 (69%)	6 (60%)	6 (60%)	0.813
Yellow dots	23 (66%)	9 (90%)	5 (100%)	0.033
Broken hairs	20 (57%)	5 (50%)	4 (80%)	0.492
Vellus hairs	18 (51%)	3 (30%)	1 (20%)	0.201

DISCUSSION

Alopecia areata (AA) is an autoimmune, non-scarring hair loss disorder with a variable clinical course, ranging from patchy hair loss to complete scalp or body involvement [16]. Accurate assessment of disease activity and chronicity is essential for diagnosis, prognosis, and treatment planning. Trichoscopy, a non-invasive dermoscopic technique, has emerged as a valuable tool for evaluating hair and scalp disorders, including AA [17].

Trichoscopic Features and Disease Activity

In the present study, exclamation mark hairs (66%) and black dots (72%) were the most prominent features associated with active lesions. Statistical analysis confirmed a significant association of these features with active disease ($p < 0.05$). These findings are consistent with previous studies, which report that exclamation mark hairs represent tapered proximal shafts due to autoimmune follicular attack, while black dots indicate cadaverized hairs within follicular openings, serving as markers of ongoing follicular damage [18,19].

Broken hairs (58%) were also significantly associated with active disease. Their presence reflects acute mechanical or immune-mediated disruption of hair shafts, corroborating prior observations by Tosti et al. [20].

Conversely, yellow dots (84%) were more prominent in chronic or extensive AA, although not statistically significant with active vs stable lesions. Yellow dots represent keratin-filled follicular ostia, indicative of inactive or miniaturized follicles, and are often reported in chronic disease or extensive alopecia totalis/universalis [21,22].

Vellus hairs (44%), predominantly observed in regrowth areas, indicate early recovery and have been associated with favorable prognosis [23].

Association with Clinical Patterns

Patchy AA showed higher prevalence of exclamation mark hairs and black dots, whereas alopecia totalis and universalis exhibited predominant yellow dots, reflecting chronicity and follicular inactivity. This aligns with prior research showing that trichoscopic patterns can differentiate disease severity and guide prognosis [24,25].

CONCLUSION

Trichoscopy is a non-invasive, reliable, and valuable tool for the evaluation of alopecia areata. Characteristic features such as exclamation mark hairs and black dots are strongly associated with active disease, while yellow dots indicate chronicity or extensive involvement. Broken hairs reflect ongoing follicular damage, and vellus hairs signify early regrowth and favorable prognosis. Routine trichoscopic assessment can aid in early diagnosis, monitoring disease activity, guiding treatment decisions, and prognostication, reducing the need for invasive procedures like scalp biopsy.

Declaration:

Conflicts of interests: The authors declare no conflicts of interest.

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