



**ORIGINAL RESEARCH PAPER**

**Dermatology**

**CLUES IN TRICHOSCOPY : A RAPID USEFUL METHOD TO DIFFERENTIATE TINEA CAPITIS AND ALOPECIA AREATA IN CHILDREN**

**KEY WORDS:** Trichoscopy, Tinea capitis, Alopecia Areata.

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**ABSTRACT**

Trichoscopy is a non-invasive diagnostic tool that allows visualization of morphologic features that cannot be visible to naked eye; hence enhancing the diagnostic accuracy. Tinea capitis and Alopecia areata are considered the most common acquired causes of alopecia in paediatric population. This study included total 30 children under 12 years of age of which 15 were diagnosed as Tinea Capitis via clinical and microscopic examination with KOH and 15 were diagnosed as Alopecia Areata clinically. In all cases were examined clinically and dermoscopically. Dermoscopic features of Tinea Capitis were comma hair, corkscrew hair, zigzag hair, morsecode hair, black dots. Black dots, vellus hair, exclamation mark hair, yellow dots, pigtail regrowing hair, tulip hair were observed in Alopecia Areata. Comma hair, zigzag hair, morse code hair and corkscrew hair are characteristic findings in tinea capitis. The most common specific finding of Tinea Capitis is comma hairs. Black dots are non specific, can be observed in both the Alopecia Areata and Tinea capitis. The vellus hair, exclamatory mark hair, yellow dots are specific dermoscopic markers of Alopecia areata differentiating it from tinea capitis. Trichoscopy can be used as simple and non invasive diagnostic tool to differentiate Tinea capitis from alopecia areata.

**INTRODUCTION:**

Hair loss is a common health problem; it can cause psychological and emotional stress to the patient and concerned parents<sup>1</sup>; so cause of hair loss should be diagnosed early.

Tinea capitis and Alopecia areata are considered the most common acquired causes of alopecia in paediatric population.<sup>2</sup>

Tinea capitis is a superficial fungal infection of scalp, hair follicle and intervening skin. The causative pathogens belong to Trichophyton and Microsporum genera. Tinea Capitis can be classified as non inflammatory (black dot or scaly ) and inflammatory (kerion or favus)<sup>3</sup>. Diagnosis of tinea capitis can be done by clinical examination, microscopic examination with KOH, and fungal culture<sup>4</sup>. Now a days trichoscopy help in diagnosing Tinea capitis<sup>5</sup>.

Alopecia areata is a type of non scarring alopecia of scalp. It is an autoimmune disease. Clinically it presents as well circumscribed, smooth, oval bald patches affecting any hair bearing areas most commonly scalp. Trichoscopy have been used as diagnostic and follow up response indicator in Alopecia Areata patients<sup>6,7</sup>.

Trichoscopy i.e dermoscopy of hair and scalp is a non-invasive diagnostic tool that allows visualization of morphologic features that cannot be visible to naked eye; hence enhancing the diagnostic accuracy.<sup>8</sup>

It helps in visualisation of epidermal portion of hair follicle, interfollicular epidermis, vascular arrangement.

Aim of this study to identify the specific trichoscopic features seen in Tinea capitis and Alopecia areata. And to study the trichoscopic findings differentiating these two conditions.

**METHODS:**

This is observational analytical study. The study was carried out on 30 patients which were selected from outpatient clinic of department of Dermatology, MIMER Medical College, Talegaon Dabhade, Pune during the period June 2017 to January 2018. After taking written informed consent from parents of each concerned child, we included 30 children of less than twelve years of age having patchy hair loss. Out of them 15 were diagnosed as Tinea capitis via clinical and direct microscopic examination with KOH and other 15 were diagnosed as alopecia areata clinically.

Laboratory Examination: The specimen was collected in a sufficient amount from the periphery or centre of hair loss patch (scales or plucked hairs). Plucked hair roots and skin scraping were collected

and mounted in 10% potassium hydroxide solution. The slide was heated for some time and examined microscopically for spores.

In all cases, affected area of scalp was examined clinically and dermoscopically (using Heine delta 20 handheld dermoscope of 10x to 16x magnification.)

Trichoscope Examination : In this study, a hand-held trichoscope (Heine Delta 20) was used. Trichoscope was gently placed over the lesion after covering the lesion with immersion oil, so that it is in the center of the contact plate. The examiner's eye was placed as close as possible to the eyepiece, one hand should be free to adjust the focusing ring until a clearly focused image was obtained. Disinfection of the lens with alcohol swab was done after and before every use of trichoscope to avoid transmission of infection. Digital photographs (clinical & dermoscopic) of all lesions were taken.

**Inclusion criteria :**

- Age < 12 years
- Presence of patchy hair loss in scalp
- Clinical diagnosis as Tinea capitis (KOH +ve) or Alopecia areata
- Parents/guardian willing for written informed consent.

**Exclusion criteria :**

- Age > 12 years
- Clinical diagnosis other than Tinea capitis (KOH +ve) or Alopecia areata.
- Parents/guardian not willing for written informed consent.

**RESULTS:**

The obtained results were collected and tabulated and different dermoscopic features of Tinea Capitis and Alopecia Areata that were found in pediatric patients were statistically analysed.

In patients with Tinea Capitis, it was found that 11(73.33%) were males and 4(26.66%) were females; with mean age (7.9) years. In patients with Alopecia Areata, there were 9 males (60.0%) and 6 females (40.0%); with mean age(6.5) years (Table 1).

**Table 1**

Variable	Tinea capitis (n=15)	Alopecia Areata (n=15)
Mean age in years	7.9	6.5
Males	11(73.33%)	9(60%)
Females	4(26.66%)	6(40%)

The clinical examination of 11 patients out of 15 patients with Tinea Capitis, revealed fine scaling in alopecic patch, diameter

ranging from 0.5 centimetres (cm) to 4 cm , three patients had alopecic area with partial yellow crust on it and partially purulent draining and one patient was having shiny patch. In all patients with Tinea Capitis, spores were seen on microscopic examination with KOH.

Clinical examination of 14 Alopecia Areata patients revealed shiny, well defined alopecic patches and one was having fine scaling. Diameter of patches ranging from 1 cm to 6 cm in diameter.

It was found that the most frequent dermoscopic features of the Tinea Capitis group were comma hairs in 11 of 15 patients (73.3%) followed by corkscrew hairs in 10 of 15 patients (66.6%), zigzag hairs in 8 of 15 patients (53.3%), Morse code hairs in 4 of 15 patients (26.6%), and black dots in 2 of 15 patients (13.3%) (Figure. 1).

It was detected that the most frequent dermoscopic features of the Alopecia Areata group were black dots in 11 of 15 patients (73.3%) followed by vellus hair in 10 of 15 patients (66.6%), exclamation mark hairs in 9 of 15 patients (60%), yellow dots in 8 of 15 patients (53.3%), pigtail regrowing hairs in 4 of 15 patients (26.6%), and tulip hairs in 2 of 15 patients (13.3%) (Figure. 2).

Figure 1

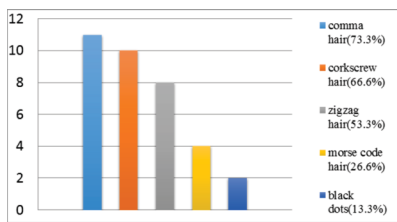


Figure 2

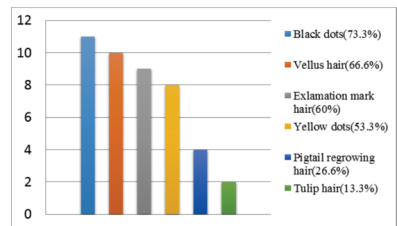
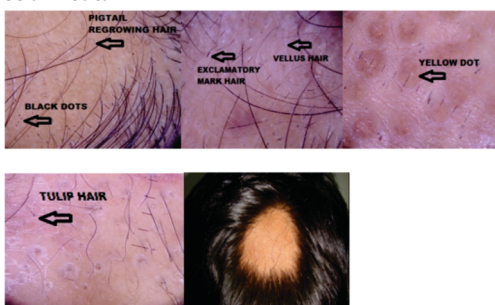


Figure 3: Clinical picture and trichoscopic findings of Tinea Capitis



Figure 4: Clinical picture and trichoscopic findings of Alopecia Areata



**DISCUSSION:**

Tinea capitis and alopecia areata are the most common causes of alopecia in paediatrics<sup>9</sup>. Most of Tinea capitis cases especially non-scaly type may clinically appear same as alopecia areata, so trichoscopy has recently become a useful diagnostic tool for Tinea Capitis and Alopecia Areata, especially in doubtful cases as lab investigations like fungal culture or biopsy may take several weeks<sup>2,7</sup>.

In this study, using trichoscopic examination, comma hairs were observed in 11 of 15 (73.3%) patients with Tinea Capitis. Comma hairs, are slightly curved and fractured hair shafts. These are associated with ectothrix and endothrix-type fungal invasion. Comma hairs were also seen in other studies, as El-Taweel et al.<sup>10</sup> and Yu-Ting Lin et al.<sup>11</sup>. These studies found comma hairs in 55% and 92% patients, respectively, which were close to our study results. On the other hand, Slowinska et al.<sup>12</sup> detected comma hairs in four of four (100%) patients.

In our study, corkscrew hairs were seen in 10 out of 15 (66.6%) patients with Tinea Capitis. The trichoscopic finding of corkscrew hair seems to be a variation of the comma hair, especially in black patients. In other studies, corkscrew hairs were 67% in Hughes et al. i.e. four of six patients<sup>13</sup>, 80% in Ekiz et al. i.e. 12 of 15 patient<sup>14</sup> and 45% in El-Taweel et al. i.e. nine of 20<sup>10</sup>. Zigzag hairs were seen in 8 of 15 (53.3%) patients with Tinea Capitis in this study. While it was 25% and 46% in studies like El Taweel et al<sup>10</sup> and Yu-Ting Lin et al<sup>11</sup> respectively.

In this study, Morse code hairs were observed in 4 of 15 (26.6%) patients with Tinea Capitis; other studies found these hairs in six of 13 (46%)<sup>11</sup> and in four of five (80%)<sup>15</sup> patients. Morse code hairs are alternate dark and light banded hairs with paler parts representing fungal penetration from within<sup>11</sup>.

In our study, black dots were seen in 2 of 15 (13.3%) patients with Tinea Capitis; these were also seen in other studies, such as El-Taweel et al. in 13 of 20 (65.0%)<sup>10</sup> patients. Black dots are remnants of broken hairs or dystrophic hairs when they break at the level of scalp.<sup>7</sup>

On trichoscopic examination of Alopecia Areata patients, it was found that most frequent finding was black dots which was present in 11 of 15 (73.3%) patients. This finding was comparable with other studies like El Taweel et al (60%)<sup>10</sup> and 63.3% in Karadag & Gulec et al<sup>16</sup>.

In this study 2<sup>nd</sup> most common finding in Alopecia Areata patients was vellus hairs (43.3%). Vellus hairs are hypopigmented, thin hairs as compared to terminal hairs. In other studies vellus hairs were 40%<sup>10</sup> and 46.3%<sup>16</sup> and 40.9%<sup>18</sup>.

Exclamation mark hairs were found in 9 of 15 (60%) patients in this study which was comparable with other study findings like 55% in El Taweel et al<sup>10</sup> and 42.9%<sup>16</sup>. It occurs due to the narrowing of hair shafts toward proximal end of the follicles. It was found that they were a sign of active Alopecia Areata, as they were seen in active cases of the Alopecia Areata at the periphery of the lesions.

In this study, yellow dots were found in 8 of 15 (53.3%) patients. It was 55%<sup>10</sup> and 83.7%<sup>16</sup> in other studies. For the diagnosis of alopecia areata, other signs of alopecia areata should be present simultaneously, because isolated yellow dots may be seen in trichotillomania, hypotrichosis simplex, and even tinea capitis, as stated by Inui<sup>17</sup>.

Pigtail regrowing hairs were reported in 4 of 15 (26.6%) patients with Alopecia Areata; these were seen in other studies, e.g., in two of 49 (4.1%)<sup>10</sup> and in three of 20 (15%)<sup>16</sup> patients. Pigtail regrowing hair is a possible sign of spontaneous remission of the Alopecia Areata.

Tulip Hair is occasional finding of Alopecia Areata found in 2 of 15 (13.3%) patients. These are dark, short hairs with tulip flower shaped ends. These are also seen in trichotillomania.

To summarize, most common trichoscopic feature of Tinea Capitis is comma hairs followed by corkscrew hair, zigzag hairs, morse code hairs and black dots. And it was found that most frequent trichoscopic finding in Alopecia Areata is black dots followed by vellus hairs, exclamation mark hair, yellow dots and tulip hair.

Although the research has reached its aims, there was some unavoidable limitation. Because of time limit, this research was conducted only on a small size of population who were attending out patient dermatology department. Therefore, to generalise the results for larger groups, the study should have involved more participants.

#### CONCLUSION:

Comma hair, zigzag hair, morse code hair and corkscrew hair are characteristic findings in tinea capitis.

The most common specific finding of Tinea Capitis is comma hairs. Black dots are non specific, can be observed in both the Alopecia Areata and Tinea capitis.

The vellus hair, exclamatory mark hair, yellow dots are specific dermoscopic markers of Alopecia areata differentiating it from tinea capitis.

Trichoscopy can be used as simple and non invasive diagnostic tool to differentiate Tinea capitis from alopecia areata.

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