Clinicomycologic Profile And Trichoscopic Findings In Tinea Capitis Among Pediatric Patients: A Study Of 21 Cases

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Abstract

Background: Trichoscopy serves as a useful noninvasive approach for evaluating patients with tinea capitis hair loss, since it is rapid and simple to execute .

Aim: To study the trichoscopic features in patients with Tinea Capitis.

Materials and methods: Study included 21 children affected with Tinea capitis. Thorough examination of the scalp of all children with lesions were examined under a magnification using a digital trichoscope.

Results with discussion: Of the total children included, 13 were female (61.9%) and 8 male (38.1%) with tinea capitis. The patients' average age was 6.56 ±3.25 years (from 2 to 12 years) .The most prominent feature of Tinea Capitis in both inflammatory and non-inflammatory is presence of Black dot. In addition, comma hairs (57.8%), broken hairs (42.1%) and perifollicular scales (36.8%) were common findings seen in non-inflammatory type, whereas perifollicular scaling (100%) with crusting (100%) and discharge (100%) were seen commonly in inflammatory type.

Conclusion: Trichoscopy represents a very useful diagnostic tool in assessing patients with tinea capitis-related hair loss, as it helps in differentiating tinea capitis from other alopecias seen in children, even before mycological evidence can be obtained.

Key words: Tinea capitis , dermatophyte, trichoscopy, pediatric hair loss , Comma hairs

INTRODUCTION:

Tinea capitis is a dermatophytic infection of the scalp, frequently encountered in children[1,2]. The epidemiology of tinea capitis varies greatly depending on geographic setting and population group. Tinea capitis affects 7.1% to 47.5% of children worldwide, with an incidence of 0.5% to 10% in India[3,4]. Trichophyton violaceum (88.6%) is the most common etiological agent in Northern India, followed by Trichophyton mentagrophytes complex (43%), Trichophyton rubrum (21.8%), and Trichophyton tonsurans (61.1%) in Kashmir.[1,2,4]

Diagnosis is usually made by dermatological examination, microscopic examination of hair root treated with potassium hydroxide (KOH) or by fungal culture. Fungal culture reporting may take several weeks causing delay in diagnosis and initiation of a prompt treatment.[5]

Trichoscopy may therefore be extremely beneficial in this setting, as it is a rapid , non-invasive and low-cost diagnostic tool for identification of features not appreciated with naked eye. [6,7]The presence of certain trichoscopic features may aid in the diagnosis.

The number of studies carried out on trichoscopy in India is limited, hence this study was done to document the trichoscopic features of tinea capitis.

MATERIALS AND METHODS:

This study was a descriptive observational study done during the period, January 2021 to June 2021. This study included 21 children, <18 years of age who presented to our paediatric dermatology clinic and clinically diagnosed with Tinea capitis and confirmed with KOH , Calcoflour white staining and fungal culture. Exclusion criteria: Patients on treatment for tinea capitis, patients on systemic anti fungal treatment, patients who applied any kind of topicals over the lesion and unwilling patients. Written and informed consent from parents of all the children enrolled were taken.

A detailed history regarding name, age, gender, location; presenting complaint (with regard to patchy hair loss); exploration of the presenting complaint; past history, associated diseases, and history of handling pets were collected.

Thorough examination of the areas of patchy hair loss, including site , number and surface description (scaling, fissuring,crustations) was done along with (ii) Digital photography of the lesions with patchy hair loss,(Cannon SD was used in the study).

Sufficient amount of specimen was collected from the lesion (scales or plucked hairs). Microscopic examination of hair roots and skin scrapings with 10% potassium hydroxide and calcoflour white was done to observe long slender hyaline septate hyphae . The samples were inoculated on Sabouraud's agar and potato dextrose agar and kept at 30 °C for 4 weeks, with frequent inspections.

Trichoscope Examination:

A digital hand held Trichoscope was used to examine the affected areas of scalp under a magnification of 20X , 40X and 200X. In this study, an e scope(digital trichoscope) was used which helps in blocking reflected light from the skin surface without the use of immersion gels. With the help of Trichoscope, various images at different magnifications of 20, 40 and 200 were obtained .Decontamination of the lens with 70% alcohol was performed to prevent infection transmission.

All the obtained data were collected, tabulated and IBM SPSS version 22 was used for statistical analysis.

Our study was approved by the Institutional Ethical Committee.

RESULTS:

Our study consisted of 13 female (61.9%) and 8 male (38.1%) children with tinea capitis. The average age of patients with Tinea capitis was 6.56years ± 3.25 (ranging from 2 to 12 years). Vertex and the parietal regions of the scalp were the most common sites involved . Dermatological examination of 19 patients revealed scaly alopecic area (0.5 -5 cm) and 2 patients had crusting/discharge on the lesion.

In 19 patients, long branching septate hyphae and spores were seen in the KOH and calcoflour white preparations performed from the lesional area and 2 patients showed negative results. In cultures, 9 patients showed positive for trichophyton verrucosum, 2 patients had Trichophyton violaceum in cultures, Microsporum canis was isolated from 5 patients and 5 patients had negative cultures.

In the trichoscopic examination , the most frequent findings were: Black dots (seen in 19 patients 90.5 %)(figure 1& 2), Comma hairs (12 patients , 57.1%)(figure 3), Broken hairs (9 patients, 42.9%)(figure 4), Perifollicular yellow scales (9 patients,42.9%)(figure 5).

Fig 1: Macroscopic view of tinea capitis

Fig 2: Trichoscopic view of Comma hairs

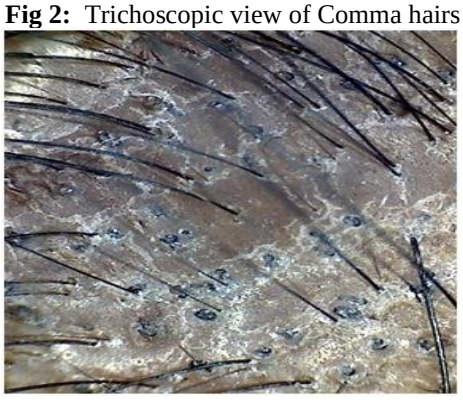


Fig 3: Trichoscopic view of black dots

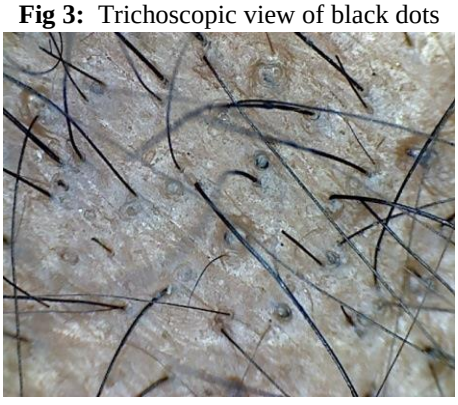


Figure 4: Trichoscopic view of Broken hairs

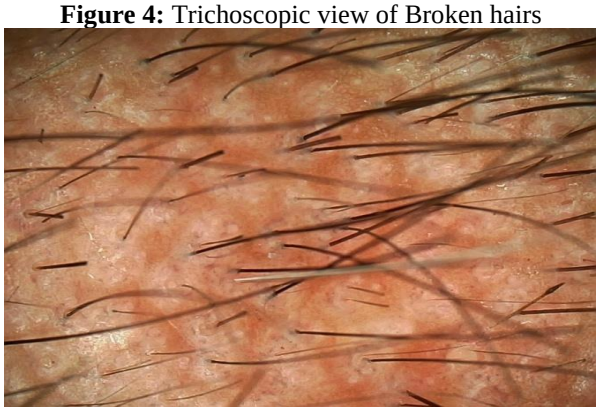
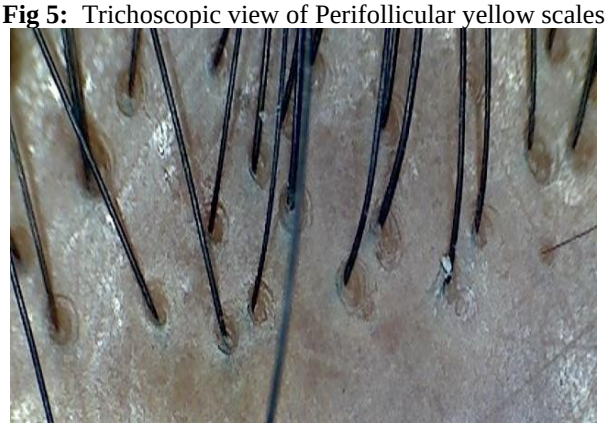


Fig 5: Trichoscopic view of Perifollicular yellow scales



Less commonly observed findings were : Interfollicular yellow scales (14.3%)(figure 6), Interfollicular white scales (14.3%)(figure 7), perifollicular white scales (9.5%)(figure 8), Crusting (9.5%), Discharge (9.5%)(figure 9), Zigzag hair (4.8%), Hair cast (4.8%), vellus hair (4.8%).

Fig 6: Trichoscopic view of Interfollicular yellow scales

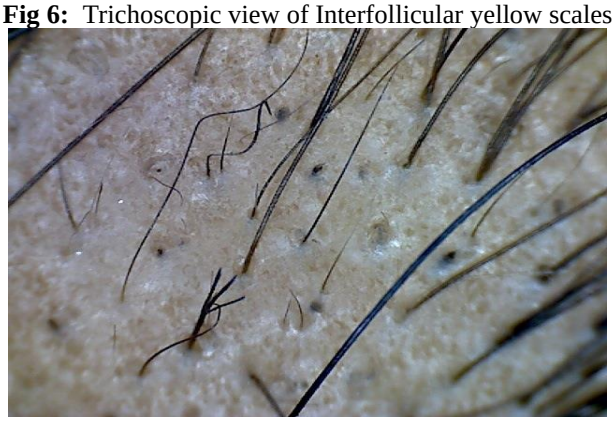


Fig 7: Trichoscopic view of Interfollicular white scales

Fig 8: Trichoscopic view of perifollicular white scales

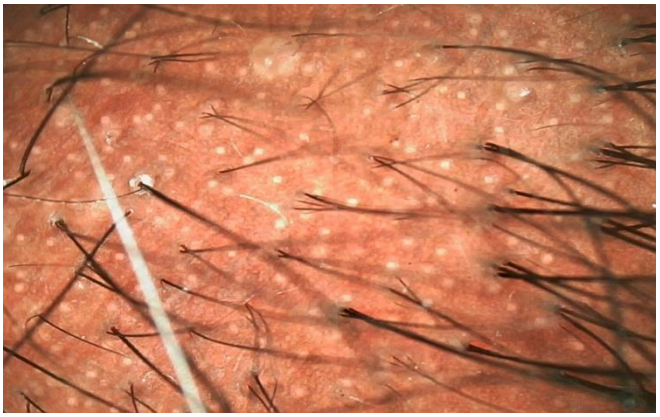
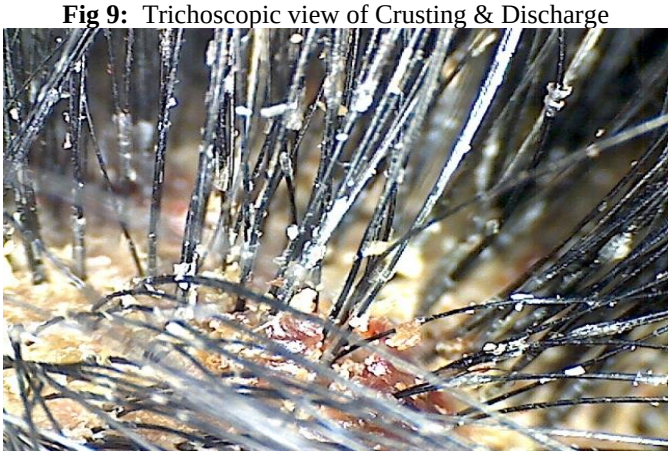


Fig 9: Trichoscopic view of Crusting & Discharge



In cases of non inflammatory type, the commonest findings observed were black dot (89.5%) , comma hairs (57.8%) , broken hairs (42.1 %) and perifollicular scales(36.8%) . In cases of inflammatory type, the commonest findings seen were black dot (100%), perifollicular scaling (100%) with crusting (100%) and discharges (100%) (Table no 1).

Table no 1 : Trichoscopic findings of tinea capitis

Trichoscopic findings	**Inflammatory (n= 2)**		**Non inflammatory (n=19)**		**Total (n=21)**	
	N	**%**	**N**	**%**	**N**	**%**
Black Dot	2	100.0	17	89.5	19	90.5
Comma Hairs	1	50.0	11	57.8	12	57.1
Perifollicular Yellow Scales	2	100.0	7	36.8	9	42.9
Broken Hair	1	50.0	8	42.1	9	42..8
Interfollicular Yellow Scales	0	0.0	3	15.8	3	14.3
Interfollicular White Scales	0	0.0	3	15.8	3	14.3
Perifollicular White Scales	0	0.0	2	10.5	2	9.5
Crusting/discharge	2	100.0	0	0.0	2	9.5
Vellus Hair	0	0.0	1	5.3	1	4.8
Zigzag Hair	0	0.0	1	5.3	1	4.8
Hair Cast	0	0.0	1	5.3	1	4.8

Table no 2 : Comparison of trichoscopic findings in Tinea capitis

Trichoscopic findings	Present study (n = 21)		El- Taweel et al (n = 20)	
Comma hair	12	57.1%	11	55%
Black dot	19	90%	13	65%
Broken hair	09	42.8%	18	90%
Corkscrew hair	0	-	09	45%
Perifollicular yellow scales	9	42.9%	0	-

DISCUSSION:

Tinea capitis is considered to be the most common cause of patchy hair loss of the scalp in paediatric age group, [8] caused Trichophyton and Microsporum species . Clinical presentation in Tinea capitis is extremely diverse and is influenced by

factors like host resistance, degree of involvement of hair and inflammatory response. Dermatophytes are classified as endothrix and ectothrix based on the nature of hair involvement. Based on the clinical forms there are four main types[9]:

Black Dot Type: In this type, hair invasion by fungi leads to endothrix infection .Trichophyton violaceum and T. tonsurans are the most frequent species involved. The infected hair breaks off abruptly at the orifice of the follicles leaving behind a stub filled with spores known as black dot. They are polygonal or angular in outline and margins are often indistinct with a variable amount of scaling.

Gray Patch Type: This type of lesion usually starts as a tiny erythematous papule, surrounding the hair shaft and in few days it becomes greyish, and lusterless with discoloration. Microsporum canis and M. audouinii are most commonly associated with type of lesion followed by Trichophyton violaceum and T. tonsurans rarely . Generally , there are multiple lesions along with itching and hair breakage within a few millimeters from the scalp . Distinct brilliant green fluorescence is demonstrated under woods lamp from infected hair, which may be absent in infections due to T. violaceum & tonsurans.

Kerion: Kerion is a painful inflammatory lesion with loose hair remains along with pus discharge from the follicles. Frequent association with lymphadenopathy and dense crusting with extensive tangling of adjacent hair. Largely, T. verrucosum and T.mentagrophytes are related to this type of violent reaction. Infection usually resolves with scarring and patchy permanent alopecia.

Favus: Characterized by a perforating Tinea capitis, due to Trichophyton schoenleinii along with T. violaceum & Microsporum gypsum. It is characterized by the presence of scutula consisting of keratinized and parakeratotic cells along with exudative inflammatory cells combined with hyphae and spores, leading to crusting. In long-standing cases, widespread hair loss as patches along with atrophy results in scarring alopecia. It does not spontaneously clear, in contrast to other forms of tinea capitis.

Patients with hair loss frequently experience peer ridicule and low self-esteem, as well as a sense that they are not being properly examined[10]. A trichoscope examination can reassure the patient of a thorough scalp examination and provide the clinician with in-depth information along with a real magnified picture of the scalp. Further, the procedure of trichoscopic analysis is easy, patient friendly and also give clues about the disease stage and progression despite facilitating diagnosis[11]. This would further contribute to reducing the incidence of recurrent infections and prevention of drug resistance. Studies about trichoscopic findings in tinea capitis are limited .

In this study **Comma hairs** were seen in 12 of 21 (57.1%) patients, which were similar to studies by Ekiz and El-Taweel et al [12,13,9,]showing 10 of 15 (66.7%)of comma hairs and 11 of 20 (55%) patients, respectively. In contrast, comma hairs were detected in (100%) by Slowinska et al [14] and Hughes et al [15]showed six of six (100%).

El-Taweel [9] and Sandoval et al[17] had reported black dots in 13 (65.0%) and it was reported in 19 of 21 (90.5%) patients in the present study. El-Taweel[9] et al reported short broken hairs in 18 of 20 (90%) patients, while Mapelli et al and Ekiz et al reported broken hairs in all patients[12,16]. However, in the current study, it was reported in only nine of 21 (42.9%) patients, indicating a comparative decrease.

The zigzag hairs that appear in black patients appear to be comma hair variations. Some studies found zigzag hairs in six of thirteen (46%) and four of five (80%) TC patients. Comma-shaped hairs and corkscrew hairs were discovered in zoophilic infections by Hughes et al[15-17]. This study isolated T. violaceum, M. canis, and T. verrucosum, which could be attributed to agricultural practices and low socioeconomic status.

To summarise, black dots are the most common trichoscopic features observed, followed by comma hairs, broken hairs, and peri follicular yellow scales. In addition these trichoscopic features not specific to tinea capitis but observed in alopecic areata along with trichotillomania. However they can be used to indicate the severity of tinea capitis. Normalization of trichoscopic features serves as a valid prognostic indicator for recovery in TC, but it does not imply full success until a full dose of treatment is completed for 6-8 weeks.

Limitations:

Advanced studies on a larger population from varied age groups and geographical locations are needed to confirm these results .

CONCLUSION:

In routine dermatology practice, Tinea capitis a dermatophytic infection of the scalp is still fairly common. While direct detection and culture remain the gold standard, they are time consuming and at times inconclusive. In clinical practice, trichoscopy has better clinical diagnostic performance. Thus, trichoscopy helps in prompt diagnosis at bed side and early initiation of treatment for tinea capitis. Quick, easy to use, non invasive tool useful in mass studies and for monitoring of treatment since it can be repeated on multiple occasions for follow up. As a result, it has the potential to be a vital diagnostic bridge between clinical diagnosis and histopathology. Trichoscopy is now commonly referred to as the dermatologist's stethoscope.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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