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ASSESSMENT OF TINEA CAPITIS USING TRICHOSCOPY AND CLINICOMORPHOLOGICAL METHODS

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ABSTRACT

Background: A frequent fungal illness found on the scalps of afflicted patients, particularly children, is tinea capitis, or TC. Trichoscopy is a non-invasive therapeutic approach that enables quick and magnified in vivo evaluation of the hair while displaying morphologic characteristics that are often invisible to the unaided eye.

Aim: The purpose of this study was to evaluate the effectiveness and use of trichoscopy in clinical evaluation as well as the various clinic-morphological patterns associated with tinea capitis.

Methods: During the research period, 70 participants with a confirmed clinical diagnosis of tines capitis were evaluated for the current investigation. Dermoscopy was used on each individual to evaluate various clinic-morphological patterns. The collected data were examined statistically.

Results: In the current study, the prevalence rate of tinea capitis was 2.67 per thousand people. The most frequent clinical variation of tinea capitis was discovered to be grey patch, which was followed by kerion and black dot. The most frequent etiologic agent linked to the condition was Trichophyton tonsurans. Rembrandt hairs, corkscrew hairs, bent hairs, zigzag hairs, and hairs that resembled morse code were among the trichoscopic characteristics. Additional observations included crusting and pustules in 89%, 67%, 43%, and 32% of cases, as well as black dots, broken hair, and scaling. There was a noteworthy correlation observed between the trichoscopic results and the kind of TC.

Conclusion: The current study suggests that trichoscopy may be regarded as a unique method for the quick assessment and evaluation of the best course of treatment for tracking the effectiveness of tinea capitis treatment.
Keywords: Comma hair, cork-screw hair, tinea capitis, trichoscopy

INTRODUCTION

Tinea capitis, often known as TC, is a dermatological illness that causes a superficial fungal infection in the scalp's hair follicles in afflicted individuals. Paediatric age groups are typically represented among patients with tinea capitis.

Nevertheless, adult people may also get tinea capitis in immunocompromised instances. The prevalence of tinea capitis in paediatric individuals ranges widely, roughly between 7% and 47.5%. It is estimated that the incidence of tinea capitis in India ranges from 0.5% to 10%.1

In the Indian context, there is significant variance observed across various geographic locations. In North India, Trichophyton (T.) violaceum is the most often associated etiological agent, accounting for 88.6% of cases, followed by T. violaceum in 60% of the cases, In mountainous areas, T. mentagrophytes was observed in 43% of cases, T. violaceum in 37.5%, and T. rubrum in 21.8% of cases in South India. T. tonsurans is thought to be involved in 61.1% of cases in Kashmir.2,3

Wood's Lamp inspection, biopsy, culture, and KOH (potassium hydroxide) mounting are often used in conjunction with clinical diagnosis of tinea capitis. These techniques are time-consuming, complicated, and typical for mycological inspection; they also call for mycological instruments and skilled workers.4 Trichoscopy is a non-invasive method that provides quick and magnified in vivo evaluation of the hair while displaying morphologic characteristics that are sometimes invisible to the unaided eye. For the purpose of verifying the clinical diagnosis of tinea capitis and tracking the effectiveness of subsequent treatment, trichomoscopy can be a helpful procedure.5

The current study sought to evaluate the use of trichoscopy in the clinical diagnosis of tinea capitis as well as the various clinic-morphological patterns associated with the illness.

MATERIALS AND METHODS

The current cross-sectional observational clinical study set out to evaluate the various clinic-morphological features of tinea capitis as well as the use of trichoscopy in clinical diagnosis. The study's participants were from the Institute's Department of Dermatology. Prior to their involvement in the study, all participants provided their written and verbal informed permission.

The study's inclusion criteria were patients having a recent, verified diagnosis of tinea capitis, subjects of all genders and all ages, and people who were willing to take part in the research. Subjects who had systemic or local antifungal medication during the previous one to six months, as well as those who withheld consent to participate in the trial, were excluded from the investigation. Seventy participants, both male and female, who met the inclusion criteria were included in the research.

Following the acquisition of informed permission and the research subjects' final inclusion, each subject had a comprehensive history obtained, and a comprehensive general clinical and dermatological evaluation was conducted with regard to the unique characteristics, distribution, and morphology of the lesions. Mycological confirmation using KOH mount was used to confirm the clinical diagnosis of the lesion. Additional investigations that may be required include Wood's lamp examination, biopsy, or culture.

Then, utilising a 30 mm lens system with 10X magnification and non-polarized and cross-polarized light, all of the participants underwent trichoscopic evaluation. In order to evaluate how the antifungal medication affected the dermoscopic findings, the current investigation included 28 participants who completed routine recalls in addition to an observational analysis.

The collected data were statistically analysed using the Mann-Whitney U test with chi-square or Fisher's exact test using the SPSS software version 21.0 (IBM Corp., Armonk, NY, USA). For both normally distributed and non-normally distributed continuous variables, the data were reported as mean and standard deviation; for categorical variables, they were expressed as frequency and percentage. An acceptable p-value for statistical significance was <0.05.

RESULTS

The current cross-sectional observational clinical study set out to evaluate the various clinic-morphological features of tinea capitis as well as the use of trichoscopy in clinical diagnosis. The current cross-sectional observational clinical study set out to evaluate the various clinic-morphological features of tinea capitis as well as the use of trichoscopy in clinical diagnosis. Seventy individuals who received a clinical diagnosis of tines capitis throughout the research period were evaluated in this investigation. The research participants' average age was 6.3±1.8 years. The bulk of the research participants—62.85% of them, or 44—were between the ages of 5 and 12; those who were younger—305 of them, or

21—were between the ages of 5 and 12, 5.71% of them, or 4, and the least—1.42% of them, or 1—were older than 18 years. In the current study, there were 51.42% (n = 36) men and 48.57% (n = 34) females.

35.71% (n=25) of the individuals belonged to the lower socioeconomic category, making up the bulk of the sample. 60% (n=42) of the individuals came from rural homes, making up the majority of the sample. The majority of individuals (45.71% of subjects) had the condition for one month, whereas 31.42% of subjects (n=22) had the sickness for less than one month. The frequency of washing/bathing was most frequently twice a week in 54.28% (n=38) of the participants, and thrice a week in 31.42% (n=22) of the subjects. Table 1 shows that 71.4% (n=50) participants reported sharing hats, towels, clothing, bedding, or combs; 37.14% (n=26) subjects reported having had animal interaction; 47.14% (n=33) subjects reported similar complaints from siblings; and 7.14% (n=5) respondents reported having had a similar sickness in the past.

According to the study's findings about the distribution of participants based on trichoscopy, L-shaped hair was observed in 2.43% (n=1) of the participants with grey patch type, 16.6% (n=3) of the subjects with kerion, and none of the subjects with black dot type. These findings were statistically significant (p=0.001). 11.11% (n=2) and 4.87% (n=2) of the participants with kerion and grey patch types, respectively, had pigtail hair; the results were statistically not significant (p=0.237). 9.09% (n=1), 11.11% (n=2), and 12.19% (n=5) of the patients had t-shaped hair, with statistically non-significant findings (p=0.472). Ninety-nine percent (n=10), seventy-two percent (n=13), and fifty-nine percent (n=23) of the participants had black spots, kerion, and grey patch types of tinea capitis, all of which showed statistical significance at p=0.003. Significant findings with p<0.001 were seen in 9.09% (n=1), 72.22% (n=13), and 36.58% (n=15) of participants with broken hair from the black dot, kerion, and grey patch kinds.

Table 2 displays that among participants with black dot, kerion, and grey patch types of tinea capitis, pustules were seen in 9.09% (n = 1), 100% (n = 18), and 7.31% (n = 3). These findings were statistically significant with p<0.001. Regarding the correlation of trichoscopic results, participants with black dot, kerion, and grey patch types of tinea capitis showed statistical significance with p<0.001, with crusting seen in 9.09% (n=1), 100% (n=18), and 7.31% (n=3) of the subjects. With a black dot, kerion, and grey patch type of tinea capitis, scaling was observed in 63.63% (n=7), 100% (n=18), and 90.24% (n=37) of the individuals, demonstrating statistical significance with p<0.001. A statistically significant p-value of 0.003 was observed for the presence of Morse code-like hair in 5.55% (n=1) and 21.95% (n=9) of the participants with kerion and grey patch type tinea capitis, respectively.

With a black dot, kerion, and grey patch type of tinea capitis, bent hair was observed in 45.45% (n=50), 50% (n=9), and 56.09% (n=23) of the participants, demonstrating statistical non-significance with p=0.768. With a black dot, kerion, and grey patch type of tinea capitis, zigzag hair was observed in 36.36% (n=4), 27.7% (n=5), and 36.58% (n=15) of the participants, demonstrating statistical non-significance with p=0.644. With a black dot, kerion, and grey patch type of tinea capitis, corkscrew hair was observed in 90.90% (n=10), 55.5% (n=10), and 68.29% (n=28) of the individuals, demonstrating statistical significance with p=0.001. With a black dot, kerion, and grey patch type of tinea capitis, commune hair was seen in 81.8% (n=9), 66.6% (n=12), and 82.92% (n=34) of the individuals, demonstrating statistical non-significance with p=0.09 (Table 2).

Bent hair was seen in 2 and 6 patients from culture-negative and culture-positive subjects for the connection of trichoscopic results to KOH-negative instances as culture-negative findings. One participant from each of the culture-positive and culture-negative instances had hair that resembled Morse code. Two individuals from the culture-positive group had zigzag hair. Two and seven participants from both the culture-positive and culture-negative instances had corkscrew hair. Table 3 summarises the prevalence of comma hair in 2 and 8 participants from the culture-positive and culture-negative groups.

DISCUSSION

Seventy individuals who received a clinical diagnosis of tines capitis throughout the research period were evaluated in this investigation. The research participants' average age was 6.3±1.8 years.

The bulk of the research participants—62.85% (n=44)—were between the ages of 5 and 12; these subjects were followed by 305 (n=21) who were under 5, 5.71% (n=4) who were between the ages of 12 and 18, and at least 1.42% (n=1) who were over 18. In the current study, there were 48.57% (n=34) females and 51.42% (n=36) men. 35.71% (n=25) of the individuals belonged to the lower socioeconomic category, making up the bulk of the sample. These statistics were

equivalent to those evaluated by Fuller LC et al. (2014) and Ekiz O et al. (2014) using participants whose demographic information was identical to that of the current investigation.

60% (n=42) of the individuals came from rural homes, making up the majority of the sample. 45.71% of patients and 31.42% (n=22) of individuals had the condition for less than one month, respectively, making up the bulk of the subjects. The frequency of washing/bathing was most frequently twice a week in 54.28% (n=38) of the participants, and thrice a week in 31.42% (n=22) of the subjects. 71.4% (n=50) participants reported sharing hats, towels, clothing, bedding, or combs; 37.14% (n=26) subjects claimed having had animal interaction; 47.14% (n=33) subjects reported comparable complaints from siblings; and 7.14% (n=5) respondents reported having had a similar sickness in the past. These bore similarities to research by Kumar P et al. (2008) and Sandoval AB et al. (2009), the authors of which reported similar illness and demographic data as those in the current study.

Based on trichoscopy results, it was observed that the distribution of study participants showed that L-shaped hair was present in 2.43% (n=1) of patients with grey patch type, 16.6% (n=3) of subjects with kerion, and none of the subjects with black dot type. These results were statistically significant at p=0.001.

T-shaped hair was observed in 9.09% (n=1), 11.11% (n=2), and 12.19% (n=5) people demonstrating statistically non-significant findings with p=0.472. Pigtail hair was seen in 11.11% (n=2) and 4.87% (n=2) patients from kerion and grey patch type exhibiting statistically non-significant results with p=0.237. Black dot, kerion, and grey patch types of tinea capitis were observed in 90.90% (n=10), 72.22% (n=13), and 56.09% (n=23) of the individuals, demonstrating statistical significance at p=0.003. Significant findings with p<0.001 were seen in 9.09% (n=1), 72.22% (n=13), and 36.58% (n=15) of participants with broken hair from the black dot, kerion, and grey patch kinds. Pustules with black dot, kerion, and grey patch types of tinea capitis were observed in 9.09% (n=1), 100% (n=18), and 7.31% (n=3) of the individuals, demonstrating statistical significance with p<0.001.

These results aligned with the research conducted by Waśkiel Burnat A et al. in 2020 and Rudnicka L et al. in 2018, where the authors reported the distribution of study subjects based on their findings on trichoscopy, which is comparable to the current study.

According to the study's findings, there was a statistically significant link (p<0.001) between the correlation of trichoscopic findings and crusting observed in 9.09% (n=1), 100% (n=18), and 7.31% (n=3) of the participants with black dot, kerion, and grey patch types of tinea capitis. With a black dot, kerion, and grey patch type of tinea capitis, scaling was observed in 63.63% (n=7), 100% (n=18), and 90.24% (n=37) of the individuals, demonstrating statistical significance with p<0.001.

A statistically significant p-value of 0.003 was observed for the presence of Morse code-like hair in 5.55% (n=1) and 21.95% (n=9) of the participants with kerion and grey patch type tinea capitis, respectively. With a black dot, kerion, and grey patch type of tinea capitis, bent hair was observed in 45.45% (n=50), 50% (n=9), and 56.09% (n=23) of the participants, demonstrating statistical non-significance with p=0.768. With a black dot, kerion, and grey patch type of tinea capitis, zigzag hair was observed in 36.36% (n=4), 27.7% (n=5), and 36.58% (n=15) of the participants, demonstrating statistical non-significance with p=0.644. With a black dot, kerion, and grey patch type of tinea capitis, corkscrew hair was observed in 90.90% (n=10), 55.5% (n=10), and 68.29% (n=28) of the individuals, demonstrating statistical significance with p=0.001. 81.8% (n=9), 66.6% (n=12), and 82.92% (n=34) of the patients had comma hair with a black dot, kerion, and gray patch type tinea capitis showing statistical non-significance with p=0.09. These results were consistent with those of Hughes R et al. (2011) and Arrazola Guerrero J et al. (2015), whose authors reported comparable findings regarding the correlation of trichoscopic findings in their research participants, as demonstrated by the results of the current investigation.

Additionally, bent hair was seen in 2 and 6 patients from culture-negative and culture-positive subjects for the connection of trichoscopic results to KOH-negative instances as culture-negative findings. One participant from each of the culture-positive and culture-negative instances had hair that resembled Morse code. Two individuals from the culture-positive group had zigzag hair. Two and seven participants from both the culture-positive and culture-negative instances had corkscrew hair. Between two and eight participants from the groups with positive and negative cultures had comma hair.

These findings were consistent with research conducted by Al Samarai AGM in 2007 and Bose S et al in 2011, wherein participants who were KOH positive and negative had comparable trichoscopy outcomes in their subjects as shown in the current investigation.

CONCLUSION

Regarding its drawbacks, the current study comes to the conclusion that trichoscopy is a unique method for quickly assessing and evaluating the best course of treatment for tinea capitis and tracking its effectiveness. at get at a more accurate conclusion, more research with a bigger sample size and a longer monitoring period is necessary.

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S. No	Characteristics	Number (n=70)	Percentage (%)
1.	**Mean age (years)**	6.3±1.8	
2.	**Age range (years)**		
a)	<5	21	30
b)	5-12	44	62.85
c)	12-18	4	5.71
d)	>18	1	1.42

3.	**Gender**		
a)	Males	36	51.42
b)	Females	34	48.57
4.	**Socioeconomic status**		
a)	Lower lower	25	35.71
b)	Upper lower	21	30
c)	Lower middle	22	31.42
d)	Upper middle	2	2.85
5.	**Residence**		
a)	Urban	28	40
b)	Rural	42	60
6.	**Disease duration**		
a)	<1	22	31.42
b)	1-3	32	45.71
c)	3-6	6	8.51
d)	>6	10	14.28
7.	**Washing/bathing frequency**		
a)	Daily	6	8.57
b)	Once a week	4	5.71
c)	Twice a week	38	54.28
d)	Thrice per week	22	31.42
8.	**Sharing caps/towels/clothes/bedding/comb**	50	71.4
9.	**Animal contact history**	26	37.14
10.	**Similar complaints among siblings**	33	47.14
11.	**Similar illness history in the past**	5	7.14

Table 1: Demographic and disease data in study participants

S. No	**Trichoscopic features**	**Tinea capitis type**						**p-value**
		Black dot		**Kerion**		**Gray patch**		
		n=11	**%**	**n=18**	**%**	**n=41**	**%**	
1.	**L-shaped hair**	0	0	3	16.66	1	2.43	**0.001**
2.	**Pigtail hair**	0	0	2	11.11	2	4.87	0.237
3.	**t-shaped hair**	1	9.09	2	11.11	5	12.19	0.472
4.	**Black dot**	10	90.90	13	72.22	23	56.09	**0.003**
5.	**Broken hair**	1	9.09	13	72.22	15	36.58	**<0.001**
6.	**Pustules**	1	9.09	17	94.44	5	12.19	**<0.001**
7.	**Crusting**	1	9.09	18	100	3	7.31	**<0.001**
8.	**Scaling**	7	63.63	18	100	37	90.24	**<0.001**
9.	**Morse code-like hair**	0	0	1	5.55	9	21.95	**0.003**
10.	**Bent hair**	5	45.45	9	50	23	56.09	0.768
11.	**Zigzag hair**	4	36.36	5	27.77	15	36.58	0.644
12.	**Corkscrew hair**	10	90.90	10	55.5	28	68.29	**0.001**
13.	**Comma hair**	9	81.81	12	66.6	34	82.92	0.09

Table 2: Distribution of study subjects based on the findings of trichoscopy

S. No	**Trichoscopic findings**	**KOH negative cases (n=22)**	
		Culture negative (n=2)	**Culture positive (n=20)**
1.	**Bent hair**	2	6
2.	**Morse code-like hair**	1	1
3.	**Zigzag hair**	0	2
4.	**Corkscrew hair**	2	7
5.	**Comma hair**	2	8

Table 3: Correlation of trichoscopic findings to KOH-negative cases as culture-negative findings