

Study of Tinea Capitis in Children Attending JLNMC Bhagalpur

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ABSTRACT

Background: Tinea capitis is a superficial fungal infection that can predominantly affects children. The etiological factors vary from region to region, and the exact incidence remains obscure. The clinicoepidemiological and mycological aspects of *T. capitis* were studied in a tertiary care centre in JLNMC Bhagalpur.

Materials and Methods: Wood's lamp examination, KOH examination, and fungal culture were performed in one hundred clinically diagnosed cases of *T. capitis* with patient's age up to 14 years over a period of 6 months. The epidemiological factors associated with the disease were also evaluated.

Results: Tinea capitis was predominant in the 3-6 and 6-9 years age groups with a male preponderance. Grey patch tinea capitis was the most common variant. KOH positivity was 76%, and *Trichophyton tonsurans* was the most common fungal isolate.

Conclusion: Tinea capitis is a very common fungal infection in children. Early diagnosis is necessary to prevent its spread in

the community as well as the development of scarring alopecia in the affected individual.

Key Words: Dermatophytosis, KOH Preparation, LCB Mount, SDA Medium, Trichophyton violaceum.

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INTRODUCTION

Tinea capitis is a dermatophyte infection that usually involves the scalp, hair follicles, and the adjoining skin. Dermatophytes are fungi that commonly infect the keratinous tissues of humans and some lower animals. The superficial layers of the epidermis, particularly the stratum corneum, and the keratin rich appendages, such as the hair shaft and nails of the living host, are invaded by these dermatophytes, where they eventually proliferate and multiply.¹ It is a common scalp infection seen in children from developing countries, often causes varying degrees of alopecia.^{2,3} Unlike other dermatophytosis that have no age predilection, tinea capitis is primarily seen in the pediatric age group, with a small number of cases also seen in adults.^{4,5}

Etiologically, in tinea capitis, wide variations have been seen in different geographic regions. Changes also occur in the etiology in a given area over a period of time. The trend of living in communities, contact with animals, the use of antibiotics, corticosteroids and antineoplastic drugs are some of the factors that contribute to the increase in the risk of infection by fungi especially dermatophytes.⁶ Moreover, it is a common dermatophyte infection in tropics, seen in a significant number of children attending the dermatology outpatient department. This study was, thus, designed to get an insight into the pattern of tinea capitis and the likely causative dermatophyte strains.

MATERIALS AND METHODS

The present study was done in microbiology department JLNMC Bhagalpur over a period of 6 months from September 2015 to February 2016. One hundred (100) clinically diagnosed cases of tinea capitis in children upto 14 years of age attending OPD were included.

A detailed history of selected cases was taken regarding name, age and address (whether rural or urban). After the detailed history, clinical examination of patients was made in well-lighted room. This was followed by a relevant history pertinent to the chief complaints (hair loss/scaly lesion/pus discharge from scalp/scalp swelling), duration of the lesions, involvement of any other body site, treatment history, and whether any family member was affected. Patients who had received any topical or systemic treatment were excluded from the study.

Cutaneous and Wood's lamp examination was done to ascertain the clinical variant of tinea capitis (grey patch, black dot, kerion, or favus). KOH examination of the skin scrapings and hair follicles was then performed to confirm the fungal etiology. Finally, a fungal culture was obtained to identify the causative fungal strain. The sample was collected after proper cleaning of the affected area with an antiseptic solution and allowing it to dry for about 1 minute. The scrapings and the affected hairs were collected, using

sterile surgical blade, and fine forceps. Each specimen was collected in autoclaved folded paper with proper labelling and then sent to the laboratory and subjected to microscopy and culture. The media used for culture was Sabouraud's dextrose agar with chloramphenicol, and Sabouraud's dextrose agar with chloramphenicol and cycloheximide with incubation temperatures of 25–28°C and 30–35°C, respectively. Identification was done by phenotypic methods that included observing the colony obverse pigmentation, type of growth, and preparation of LCB mount from colony for final identification. In addition, certain biochemical tests, such as urease were also performed as and when required.

RESULTS

The maximum number of children was in the age groups of 3–6 31 cases (31%) and 6–9 years 30 cases (30%) followed by 10-12 years 20 (20%), 0-3 16 (16%) and least number of cases in >12 years age group 3 (3%). Male cases were 71 in number (71%) whereas females comprised 29 cases (29%) [Figure-1], with a male female ratio of 2.45:1. Most of the children came from a rural background, comprising 60 cases (60%). None of the children had any other affected area other than the scalp. 10 cases (10%) had a positive history of similar lesions in their siblings. The most common clinical variant seen was the grey patch, followed by kerion, black dot tinea capitis, and favus. [Table-1] Clinical variants of tinea capitis seen in this study.(a) Grey patch tinea capitis. (b) Black dot tinea capitis. (c) Kerion, presenting as a boggy swelling over the scalp. (d) Pustular variant of tinea capitis.

Mycological examination using 10% KOH yielded 75% positivity. Subsequently, fungal culture showed a positivity of 83%, whereas 17% revealed no growth or growth of some non dermatophyte fungi.

Among the isolated dermatophytes, *Trichophyton violaceum* 74 cases (74%) emerged as the leading pathogen followed by *T. tonsurans* 17 cases (17%) *T. rubrum* 4 (4%), *T. schoenleinii* 3 (3%) and multiple strains were seen to coexist in 2% cases. [Table-2]

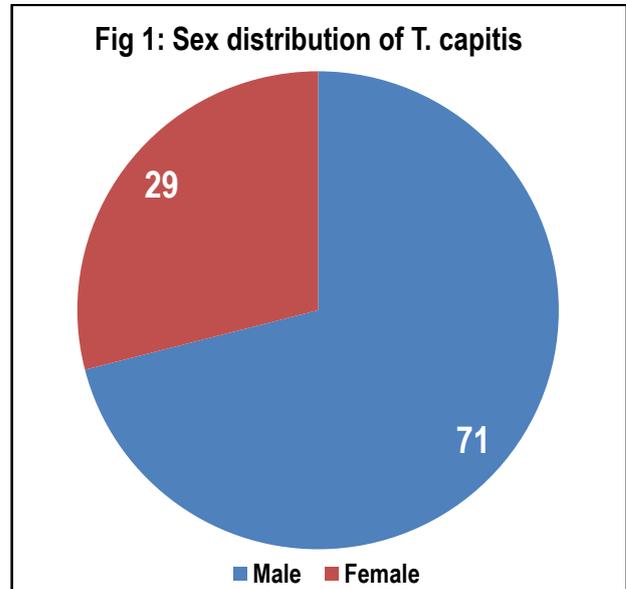


Table 1: Distribution of clinical variants, KOH and culture positivity of isolates

Clinical type	No. of cases (%)	KOH positive cases (% positivity)	Culture positive (% positivity)
Grey patch	59 (59)	43 (57.3)	47 (56.6)
Kerion	25 (25)	20 (26.7)	22 (26.5)
Black dot	15 (15)	11 (14.7)	13 (15.7)
Favus	01 (1)	01 (1.3)	01 (1.2)
Total	100 (100)	75 (100)	83 (100)

Table 2: Distribution of strains

Name of strain	No. of cases	Percentage (%)
<i>Trichophyton violaceum</i>	74	74
<i>T. tonsurans</i>	17	17
<i>T. rubrum</i>	04	4
<i>T. schoenleinii</i>	03	3
Mixed	02	2
Total	100	100

DISCUSSION

Tinea capitis is a commo dermatophyte infection seen commonly in children and rarely in adults. The clinical presentation is varied ranging from the non-inflammatory lesions to severe inflammatory variants.⁷ The noninflammatory variants include grey patch and black dot whereas the inflammatory lesions include kerion and favus, which if not treated promptly can result in cicatricial alopecia.

In the present study, the disease was found to be more common in boys than girls, with a male–female ratio of 2.45:1, which is similar to the other studies Wani MM et al.⁸ Short hair, frequent trimming of hair by contaminated scissors and blades, greater exposure to external environment while playing, and contact with cattle/pets are some predisposing factors that make male children more vulnerable to acquiring dermatophyte spores and providing a favourable environment for their proliferation.

In addition, a rural predominance of the cases was noted, with cases from rural communities far outnumbering the urban cases. Poor hygienic conditions, inability to identify the disease early in its course, use of home-based remedies, and lack of adequate and prompt medical access could be the possible factors responsible for the rural predominance.

The maximum cases were in the 3–6 and 6–9 year age group was in accordance with the results of many studies. Kalla G et al reported 85.5% cases were in the 3–10-year age group.⁹

Among the clinical types grey patch variant was the most common, followed by kerion, black dot, and favus. These results were similar to the studies where grey patch was the most common variant observed even though the sequence of other variants varied.^{10,11} However, another study demonstrated black dot to be the most common variant.^{4,9} The results are highly variable from region to region, possibly due to different infecting strains, environmental factors, and differing host immunity.

In our study *Trichophyton violaceum* was the most common fungal species isolated, which is in line with other studies, Kalla G et al reported 88.5% *Trichophyton violaceum* as the commonest strain, several other studies had reported the same results.^{4,9,11}

CONCLUSION

Tinea capitis infections are commonly seen in the paediatric population, it is a common infection in the 3–9-year age group, with males being affected more. Infection predominates in rural communities. Grey patch is the most frequently seen clinical variant in children in this region, with *T. violaceum* being the most common isolated strain.

So an early diagnosis, followed by an adequate treatment, of infection can reduce the transmission of the infection in the community, and save many children from unsightly scarring and non-scarring alopecia.

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