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G Durgadevi
Postgraduate, Department DVL, Rajah Muthiah Medical College, Annamalai University, Chidambaram, Tamil Nadu, India

PK Kaviarasan
Professor and Head of the Department, Department of DVL, Rajah Muthiah Medical College, Annamalai University, Chidambaram, Tamil Nadu, India

G Shanthi
Professor and Head of the Department, Department of Microbiology, Rajah Muthiah Medical College, Annamalai University, Chidambaram, Tamil Nadu, India

Corresponding Author:
PK Kaviarasan
Professor and Head of the Department, Department of DVL, Rajah Muthiah Medical College, Annamalai University, Chidambaram, Tamil Nadu, India

Clinical profile of tinea capitis among rural children in Cuddalore district

G Durgadevi, PK Kaviarasan and G Shanthi

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Abstract
Children are more susceptible to fungal infections. Hair infection by fungal agents, also called trichomycoses, is one of the common concerns in human beings. Dermatophytes, Malassezia species and organisms causing piedra are the common mycological agents causing hair infections. Tinea Capitis (TC) is an infection of scalp hair shaft and the surrounding caused by dermatophytes.
Aim: To study the clinical patterns of tinea capitis in rural children.
Materials and Methods: This is a cross sectional study. A total of 50 children with TC were included. Detailed clinical history, Woods lamp examination and microscopic examination using Potassium hydroxide (KOH) were done.
Results: Among 50 children, 64% (32) had non- inflammatory type, 28% (14) had inflammatory type of TC. Only two children showed positive fluorescence in Wood's lamp examination. Out of 50 specimens subjected for KOH examination, 92% (46) showed positive results. Ectothrix was the commonest type noted in 44% (22) of cases followed by mixed type in 26% (13) of cases and Endothrix in 22% (11) cases.
Conclusion: TC remains a common childhood infection in many parts of the world. Earlier treatment can prevent complications like cicatricial alopecia, secondary bacterial infections and significantly improves the quality of life of affected children.

Keywords: Ectothrix, grey patch, kerion, tinea capitis

Introduction
Trichomycoses is a form of fungal infection affecting hair follicles of scalp and also other hairy areas. TC is a fungal infection of the scalp hair follicles and the surrounding skin caused by dermatophytes. Children are particularly susceptible to TC as contact among children is more frequent between the school going ages of 6 and 14 years than in early childhood[1]. Presumably, the increased prevalence in prepubertal children is due to the low production of sebum, which results in decreased fatty acid and increased pH of the scalp, thereby facilitating colonization and subsequent infection by dermatophytes due to poor personal hygiene and poor environmental sanitation [1]. In pediatric age group, TC is more common in boys than girls. Short hair is also a predisposing factor as fungal spores can access the scalp more easily [2]. Transmission occurs via infected persons, shed infected hair, animal vectors and fomites. Clinically it is characterized by erythema, scaling, pruritus and alopecia.
The most frequent clinical presentation is non-inflammatory form: gray-patch or black dot pattern. The less common variants are Inflammatory type (kerion, favus, and pustular-like), and mixed pattern associated with gradual onset and extensive involvement. The disease is primarily caused by dermatophytes in the Trichophyton and Microsporum genera that invade the hair shaft.

Aims and Objectives
To evaluate clinical and mycological patterns of TC in school going children.

Methodology
Total number of 68 school going children aged 5-12 years were screened for TC. Fifty children who fulfilled the inclusion and exclusion criteria were included after getting written informed consent from parents. Detailed history and thorough clinical examination was

carried out to see the morphological pattern, presence of scales, hair loss, pus discharge, boggy swelling in all the areas of scalp. Cervical lymph node examination was done to look for any evidence of lymphadenopathy. Examination of other areas of skin and nail was also done. Clinical photographs were taken, woods lamp examination was done and samples were taken for direct microscopic examination using KOH.

The affected area of scalp was cleaned with 70% alcohol thereby eliminating the bacterial contamination, then allowed to dry for a minute. The skin scrapings and hair stubs were collected with the help of sterile surgical blade and forceps from the active periphery of the lesion. The collected material and hair were placed over the glass slide with a drop of 10% KOH, covered with a coverslip and examined under microscope. The presence of spores (ectothrix and endothrix) and hyphae were noted under lower power and high power.

Results

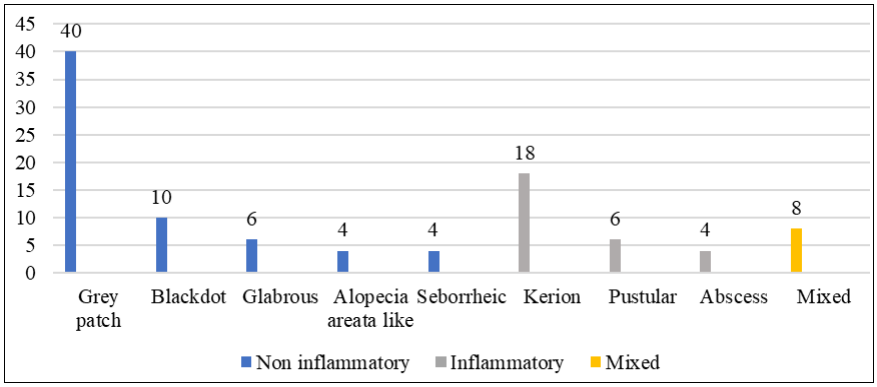
TC in children was most commonly seen in the age group of 5 to 8 years in our study with 52% (n=26) and mean age was 7.84 years. Of the 50 children, 32 were boys and 18 were girls. The boys to girls ratio was 1.77:1.

Non inflammatory type of TC was the most frequent clinical type, seen in 64% (n=32) followed by the inflammatory type seen in 28% (n=14) and mixed type in 8% (n=4). Out of non-inflammatory type, grey patch type was the most common form seen in 40% (n=20), followed by black dot type in 10% (n=5), glabrous type in 6% (n=3) and alopecia areata like and seborrheic type seen in 4% (n=2) each. Kerion was the most common inflammatory type seen in 18% (n=9), followed by pustular type seen in 6% (n=3) and abscess type in 4% (n=2). Only two patients showed positive yellow green fluorescence in Wood's lamp examination and they showed ectothrix spores in KOH examination.

Of the total fifty specimens subjected for KOH examination, 92% (n=46) showed positive results, of which 44% (n=22) showed ectothrix, 22% (n=11) showed endothrix, whereas 26% (n=13) showed the presence of both endothrix and ectothrix.

Table 1: Age wise tinea capitis in children (N=50)

Age (years)	Non-inflammatory	Inflammatory	Mixed	Total
5-8	17	7	2	26
9-10	9	3	1	13
11-12	6	4	1	11
Total	32	14	4	50
Percentage	64%	28%	8%	100%



Clinical profile of tinea capitis (percentage)

Table 2: Koh examination of tinea capitis

Koh mount	Number (N)	Percentage (%)
Ectothrix	22	44
Endothrix	11	22
Both	13	26
Negative	4	8
Total	50	100

Fig 1: Grey patch tinea capitis in occipital region

Fig 2: Kerion in parietal region

Fig 3: Fungal hyphae in 10% KOH

Discussion

Dermatomycosis is a superficial fungal infection which infect and survive on dead keratins of skin, hair, and nail. Clinically, it has been named according to affected anatomic location such as tinea corporis (body surface) and tinea capitis (scalp). The clinical appearance of scalp lesion substantially helps in diagnosis, which can be further supported by mycological tests either by direct 10–20% potassium hydroxide (KOH) examination of hair/scalp scraping, or by isolation of the dermatophyte on Sabouraud Dextrose Agar (SDA) media. The main aim of this study is to evaluate clinical patterns of TC with microscopic evaluation. There are studies reporting rise in TC among children especially in developing countries due to poverty, overcrowding, and lack of awareness [3].

The most commonly affected age group in our study was 5 to 8 years (52% (n=26)) and mean age was 7.84 years. Similar result of higher incidence in 4-7-years age group was noted in Yemisi *et al* study [4] (58%). But Menan *et al* [5] observed in much higher age group (8–11 years). This could be attributed due to lack of awareness on personal hygiene, hair care in preadolescent age group [3]. The lower incidence of TC in our study in pre-adolescent age group (8-12 years), compared to less than 8 years age group is due to fungistatic action of sebum, which protects from dermatophytosis.

In our study, out of 50 children 64% (32 children) were boys and 36% (18 children) were girls. The boys to girls ratio was 1.77:1. Similar male preponderance was observed in other studies carried out by Kalla *et al* (1.8:1), Pooja *et al* (1.73:1), Dalal *et al* (2.2:1) and Kundu *et al* (2.8:1) [6-8, 1]. The higher prevalence in males could be associated with the fact that boys have short hairs, more external exposure owing to outdoor activities, frequent trimming, combing, cutting of hair in saloons using contaminated scissors and blades, following poor hygiene practices [9].

Only two patients showed positive yellow green fluorescence in Wood's lamp examination and they showed ectothrix spores in KOH examination.

In our study, non inflammatory type of TC was the most frequent clinical type, seen in 64% (n=32) followed by the inflammatory type in 28% (n=14) and mixed type of TC in 8% (n=4). Similar observations were made by Dalal *et al* [8] (64% non-inflammatory and 36% inflammatory) and Grover *et al* [10]. (56.5% non-inflammatory, 32.7% inflammatory and 10.7% mixed).

In our study, the total number of non-inflammatory type of TC was 32. Grey patch type was the most common form, seen in 40% (n=20), followed by black dot (10% (n=5)), glabrous 6% (n=3)) and alopecia areata like and seborrheic type in 4% (n=2)) each. Similar results were observed in Dalal *et al* study, in which grey patch (48%) was the most common finding followed by black dot (28%), seborrheic variant (7%). The frequency varies with other studies. Dull grey patches 86%, seborrheic type 8%, black dot type 6% were noted in Kundu *et al* study [1]. Studies by Kalla *et al* [6] and Grover *et al* [10] reported that black dot variant was the most common clinical presentation. Bose *et al* have found seborrheic type (47.36%) was the most common clinical presentation [11].

In present study, inflammatory type of TC was seen in only 14 children. Of them, kerion was the most common type seen in 18% (n=9), followed by pustular type (6% (n=3)) and abscess type (4% (n=2)). Similar results were seen in Kamalam *et al* [12] study.

Only two patients showed positive yellow green fluorescence in Wood's lamp examination and they showed ectothrix spores in KOH examination.

Out of 92% (46) positive KOH specimens 44% (n=22) showed ectothrix, 22% (n=11) showed endothrix, whereas 26% (n=13) showed the presence of both endothrix and ectothrix. Higher prevalence of ectothrix spores could be due to more clinical cases of grey patch type in the present study. Similar results were observed in Dalal *et al* [8] study which showed 59.6% ectothrix 34.2% endothrix and 8.9% mixed (both endothrix and ectothrix). However, Kundu *et al* [1] and Pooja *et al* [7] studies found, endothrix pattern (81%) more common than the ectothrix pattern.

Conclusion

TC is a common childhood fungal infection. Repeated infections could be due to infected hair acting as a reservoir. Mycological culture is confirmatory for diagnosing TC, but it may take 4 weeks to get the reports. Simple KOH examination can aid in diagnosing and starting the therapy earlier to prevent complications.

Conflict of Interest

Not available

Financial Support

Not available

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