International Journal of Research in Dermatology
Geetha K et al. Int J Res Dermatol. 2017 Sep;3(3):380-383
http://www.ijord.com

DOI: http://dx.doi.org/10.18203/issn.2455-4529.IntJResDermatol20173075

Original Research Article

Clinico mycological study of tinea capitis

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Received: 05 June 2017
Revised: 20 June 2017
Accepted: 21 June 2017

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ABSTRACT

Background: Tinea capitis is a superficial fungal infection of the scalp and scalp hair that is caused by dermatophytes most commonly in children. It is caused by genera Trichophyton and Microsporum. The aims and objectives of the study were to study the epidemiological aspects, various etiological agents, clinical types, clinic etiological correlation and to note the changing trends.
Methods: All new patients with tinea capitis were included for the study after KOH positivity. For total 98 patients in all age groups, fungal culture was performed from scalp scrapings. The epidemiological factors and the clinic etiological correlation were also assessed.
Results: Tinea capitis was found most commonly in the 5-10 years age group with a male preponderance (69%). Non inflammatory types were more commonly observed in 66.3% of cases, with grey patch being the most common type. Kerion was most common in inflammatory group. *T. tonsurans* (31.1%) was the most frequently isolated fungus followed by *T. violaceum* and *T. mentagrophytes* in 25.7% each. In previous studies *T. violaceum* was the most common agent isolated in South India, whereas *T. tonsurans* is the most common agent in this study, showing a changing scenario. The clinic mycological correlation revealed that a single pathogen may give rise to various clinical types.
Conclusions: In any location, the pathogenic species may change with time. A single pathogen may give rise to various clinical types.

Keywords: Tinea capitis, Morphological types, *T. violaceum*, *T. tonsurans*

INTRODUCTION

Tinea capitis is also known as “Ringworm of the hair”, Tinea tonsurans” and “Herpes tonsurans”.It is a superficial fungal infection of the scalp and scalp hair. The most common cause worldwide is M.canis whereas in united states it is T.tonsurans and it is T.violaceum in south India.[1]

Tinea capitis occurs predominantly in children in the age group of 3 to 14 years.[2] It is uncommon in adults. Boys outnumbered the girls in a ratio of 5:1 because of short hair in boys.[3] Transmission is increased with poor personal hygiene, overcrowding and low socioeconomic status. An early diagnosis is important to prevent transmission between children.[4]

We have done this study to know about the changing trends in the causative agents as well as the various host factors and the relationship of fungi with the clinical manifestations.

METHODS

All new patients with tinea capitis who attended our dermatology department over a period of 1.5 years from

July 2015 to February 2017 were selected for the study after KOH smear positivity. Age, sex and duration of the disease were recorded. Detailed history with regard to socio economic status, tonsure and similar lesions in siblings were taken.

Dermatological examination and systemic examination were done. Scalp scrapings and hair root samples were analyzed by KOH mount. KOH positive specimens were cultured on Sabourauds dextrose agar with and without actidione. The rate of growth, colony morphology, pigment production on the reverse and microscopic examination in lactophenol cotton blue mount towards confirmation of the isolates. Statistical analysis of data was done by SPSS and the linear correlation identified.

RESULTS

A total of 98 clinically diagnosed cases of tinea capitis were included in the study. The most common affected age group was the 0 to 5 years with 41 children (41.8%). Infection was less common in the age group above 16 years. Males formed the majority of the cases, 68 out of 98 and the male: female ratio is 2.3:1. The age and sex distribution is given in Table 1.

Table 1: Age and sex distribution.

Age (years)	Males (n=68)	Females (n=30)	Total (n=98)	Percentage (%)
0-5	27	14	41	41.8
6-10	18	11	29	29.6
11-15	13	4	17	17.3
16-20	4	0	4	4.1
21 and above	6	1	7	7.2

Table 2: Distribution of various clinical types.

Non inflammatory types	No. of patients (N=65)	Percentage (%)	Inflammatory	No. of patients (N=23)	Percentage (%)
Grey patch	28	43.1	Kerion type	21	91.4
Smooth bald patch	14	21.5	Pustular type	1	4.3
Glabrous	11	17	Abscess type	1	4.3
Black dot	7	10.7			
Seborrhoeic	5	7.7			

Table 3: Distribution of various culture positive isolates.

Culture isolate	No. of cases (N=74)	Non inflammatory types (N=46)	Inflammatory types (N=19)	Mixed (N=9)
T. tonsurans	23	18	4	1
T. violaceum	19	8	6	5
T. mentagrophytes	19	11	7	1
T. rubrum	12	8	2	2
T. verrucosum	1	1	0	0

History of tonsuring/haircut was present in 46 of the patients. Family history of dermatophyte infection was found in 15 cases. History of sharing combs and caps are seen in 56 patients. Association with other clinical types of dermatophytosis was observed in 21 patients. Non inflammatory type was the most frequent clinical type noted in 65 patients (66.3%) followed by inflammatory type in 23 patients (23.5%) and mixed type in 10 patients (10.2%) as in Table 2.

Of the non-inflammatory types, grey patch is the commonest type followed by smooth patch of baldness, glabrous, black dot and seborrhoeic types respectively. Among the inflammatory types, kerion is the commonest type followed by pustular and abscess type. Mixed type of tinea capitis was observed in 10 patients. The clinical pictures as in Figures 1-3.

Out of the total 98 specimens subjected to KOH mount, 46 showed endothrix spores and 11 showed hyaline branched septate hyphae with spores and rest of the 41 showed only spores. All the specimens were subjected to culture in sabourauds dextrose agar. Positive growth was obtained in 74 specimens. The various organisms isolated were *Trichophyton tonsurans, T.violaceum, T. mentagrophytes, T. rubrum* and *T. verrucosum.*

Distribution of various culture positive isolates is shown in table 3.The culture and LCB mount pictures of *T. tonsurans, T. violaceum* and *T. mentagrophytes* as in Figures 4 - 6.

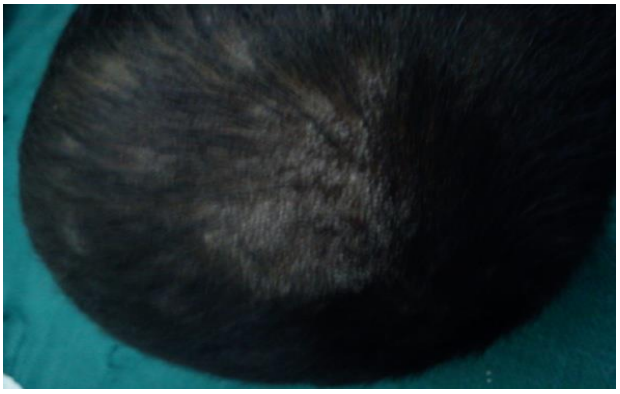

Figure 1: Grey patch.

Figure 2: Black dot.

Figure 3: Kerion.

In patients with non-inflammatory types (n=65), culture positive were 46 and among them *T. tonsurans* was isolated in 18 cases followed by *T. mentagrophytes*, *T. violaceum*, *T. rubrum* and *T. verrucosum*. Among the grey patch (n=18), *T. violaceum* was isolated in 7 cases. From the smooth bald patch type (n=9), T.tonsurans was isolated in 5 cases. In glabrous type *T. mentagrophytes* and in black dot type *T. tonsurans* was the commonest agents isolated.

In patients with inflammatory types (n =23), culture positive were 19 cases and among them *T. mentagrophytes* was isolated in 7 cases followed by *T. violaceum*, *T. tonsurans* and *T. rubrum*. Among the kerion type (n=17), T.mentagrophytes was isolated in 7 cases. *T. violaceum* was isolated from the pustular type and *T. tonsurans* from the abscess types. Among the mixed type (n=10), *T. violaceum* was the most common agent isolated. The linear correlation between the clinical types and the dermatophyte species is statistically significant (p =0.01).

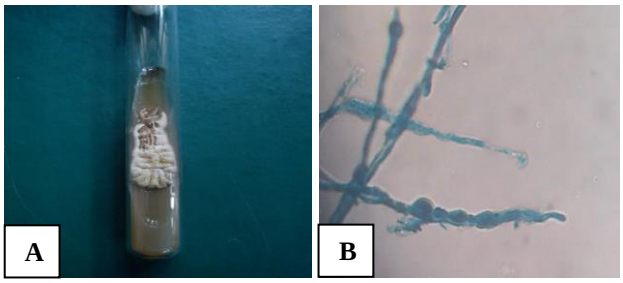

Figure 4: (A) Culture growth of *T. tonsurans*, (B) LCB mount of *T. tonsurans*.

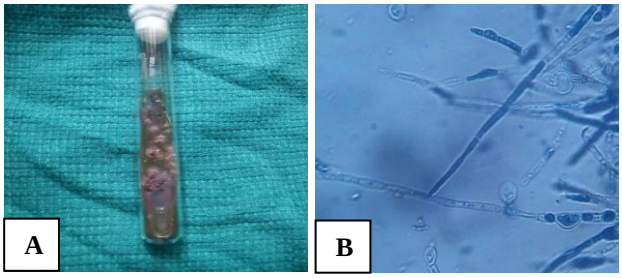

Figure 5: (A) Culture growth of *T. violaceum*, (B) LCB mount of *T. violaceum*.

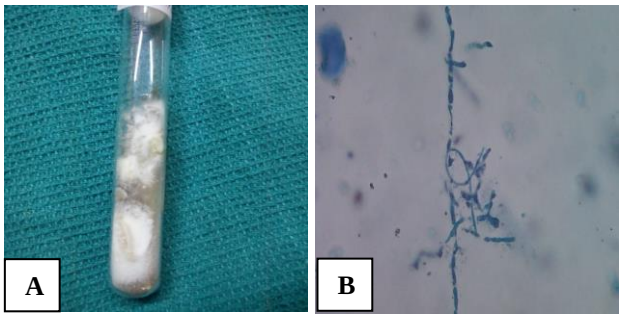

Figure 6: (A) Culture growth of *T. mentagrophytes*, (B) LCB mount of *T. mentagrophytes*.

DISCUSSION

In our study, the common age group affected was 5 to 10 years. History of tonsuring was present in 46.9% of the patients. Mubashir maqbool wani et al reported that trauma assists inoculation by clinical evidence of hair shaft infection.[5]

Most of the patients in this study group (70.4%) belonged to low socioeconomic status. Studies in Delhi by Kumari et al and Sehgal et al have shown that around 68% of

patients came from overcrowded areas with low socioeconomic status.[3]

Kamalam et al and Seema bose et al reported a higher incidence of non-inflammatory type of tinea capitis.[7] Of the 98 specimens subjected to KOH mount 46.9% showed endothrix spores. A similar observation of endothrix (58.8%) in KOH was noted by Reddy et al in their study.[8]

Among the non-inflammatory types, grey patch was the most common type, which is in concurrence with other studies by Sehgal et al and Aldayel et al.[9] In patients with non-inflammatory types, *T. tonsurans* was mostly. Of the inflammatory types, Kerion was the most common type as observed in other studies by Nath et al and Sehgal et al.[10] Among inflammatory types, *T. mentagrophytes* was the commonest agent whereas Kamalam et al noted *T. violaceum* as the commonest agent in their study.[3]

Tinea capitis epidemiology has changed significantly, especially in Western countries with *T. tonsurans* emerging as the dominant agent.[11] In North India, *T. violaceum*, *T. schoenleinii* and *T. tonsurans* have been reported to be the dominant agents.[12] In South India, studies have shown that *T. violaceum* is the principal infective agent, however *T. tonsurans* was the most common organism in this study.[13] In any location, the species may change with time, particularly as new organisms are introduced, which explains the predominance of *T. tonsurans* in our study.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the institutional ethics committee

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Cite this article as: Geetha K, Priyadharshini NS. Clinico mycological study of tinea capitis. Int J Res Dermatol 2017;3:380-3.