

Report

Tinea capitis in eastern Nepal

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Abstract

Background Tinea capitis is an increasing public health concern throughout the world. The clinical types and etiological agents vary from time to time and place to place. This study was undertaken to identify the etiological agents and to determine the clinico-etiological correlation of tinea capitis in eastern Nepal.

Methods Sixty-nine clinically diagnosed cases of tinea capitis were enrolled in this study. Hair roots and skin scrapings were collected from each patient and subjected to microscopy and culture for identification of fungal hyphae and spores.

Results Tinea capitis accounted for 4.6% of all dermatophyte infections: 68.1% occurred in patients below the age of 11 years with a male to female ratio of 1 : 1.9. "Gray patch" was the most common clinical type (52.2%), followed by "black dot" (17.4%), seborrhoeic dermatitis (13%), alopecia areata (11.6%) and pustular (4.3%). Direct microscopy of hair was positive in 62.3% of patients. Culture positivity was found in 56.7% of patients. Common isolated organisms were *Trichophyton violaceum* (48.71%), *T. mentagrophytes* (15.38%), *T. tonsurans* (12.82%), *Microsporum canis* (7.69%), *T. rubrum* and *M. gypseum* (5.12% each), and *M. audouinii* and *M. nanum* (2.56% each).

Conclusions *Trichophyton violaceum* was the most common pathogen of tinea capitis. The clinical manifestations were variable and "gray patch" was the most common clinical presentation in this part of the world.

Introduction

Tinea capitis is a superficial fungal infection of the scalp and associated hairs caused by a variety of species of the genera *Trichophyton* and *Microsporum*. Nowadays, there is an increasing trend in its incidence worldwide.¹ The clinical types and etiological agents vary from time to time and place to place.^{2,3} The disease is more prevalent in tropical countries owing to high temperature and humidity. Nepal is a land-locked country having various zones like plains and hills. Dharan town is in the Sunsari district of eastern Nepal, which is situated between 87°5'E to 87°16'E longitude and 26°2'N to 26°55'N latitude. The climate is tropical with high humidity and temperature ranging from 9.9 °C in the winter to 35.3 °C in the summer. In view of the tropical climate and paucity of the study from Nepal,⁴ this study was aimed to identify the clinical patterns and etiological agents of *T. capitis* in eastern Nepal and also to determine the clinico-etiological correlation.

Materials and Methods

This was a prospective, cross-sectional study carried out at the Department of Dermatology, B. P. Koirala Institute of Health

Sciences, Dharan, a tertiary referral hospital in eastern Nepal, from December 2001 to November 2002. All the clinically suspected cases of tinea capitis attending the outpatient department were enrolled in this study. Demographic data, age, sex, duration and predisposing factors of disease, e.g. socioeconomic status, bathing habits, household pets, use of common combs, and family history of dermatophytosis were noted in a preset proforma. The clinical presentations were classified as noninflammatory type (gray patch, black dot, seborrhoeic dermatitis and alopecia areata), inflammatory type (pustular and kerion), and favus. Scales and hairs samples were collected from the lesions for KOH preparation and culture purposes (Sabouraud's dextrose agar with 0.05% chloramphenicol and 0.5% actidione). Cultures were incubated at 28 °C for up to 6 weeks and observed weekly for growth of fungi. The genus and species identification of fungi was performed as per standard method.⁵

Result

A total of 69 cases of *T. capitis* were identified in the study period, accounting for 4.6% of all dermatophyte infections during the period. Of these 69 patients, 45 (65.2%) were females and 24 (34.8%) were male with a male : female ratio

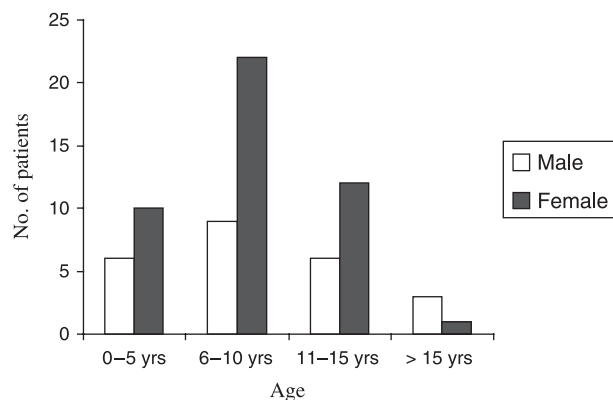


Figure 1 Age and sex distribution of the patients

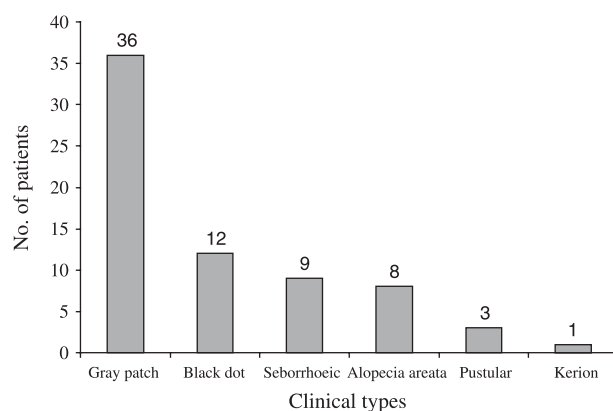


Figure 2 Frequency of different types of tinea capitis

of 1 : 1.9. The youngest patient was 2 months old, and the oldest was 44 years. The mean age and standard deviation were 9.26 ± 6.38 years. The age and sex distributions of these patients are shown in Fig. 1. Sixty-eight percent of patients were younger than 11 years. The duration of disease varied from 15 days to 5 years.

Table 1 Etiological agents

Type of etiological agents	No. of patients (%)
<i>T. violaceum</i>	19 (48.71%)
<i>T. mentagrophytes</i>	6 (15.38%)
<i>T. tonsurans</i>	5 (12.82%)
<i>M. canis</i>	3 (7.69%)
<i>T. rubrum</i>	2 (5.12%)
<i>M. gypseum</i>	2 (5.12%)
<i>M. audouinii</i>	1 (2.56%)
<i>M. nanum</i>	1 (2.56%)
Total	39 (100%)

The majority (95.7%) of patients were from a low socio-economic group. Twenty patients (29%) had a family history of dermatophytosis. Seventeen percent of patients bathed only once weekly and 72% had household pets. Use of common combs and beds were found in 90% and 93%, respectively.

Clinical patterns of tinea capitis are shown in Fig. 2. "Gray patch" was the most common clinical type (52.2%) followed by black dot (17.4%), seborrhoeic dermatitis (13%) and alopecia areata (11.6%). Three patients had pustular type and one (1.5%) patient had kerion but no case of favus was seen. One quarter of the patients had other associated dermatophyte infections, i.e. tinea faciei (8.7%), tinea corporis (7.2%), tinea pedis (1.4%) and tinea unguum (1.4%). Three patients (4.3%) had several affected sites.

Direct microscopy of hair in KOH preparation revealed fungal hyphae in 43 patients (62.3%) while fungi was identified on culture in 39 (56.7%) cases. *Trichophyton violaceum* (48.7%) was the most common dermatophyte isolated, followed by *T. mentagrophytes* (15.4%), *T. tonsurans* (12.8%), *M. canis* (7.69%), *T. rubrum* and *M. gypseum* (5.12% each) (Table 1). The correlation between the clinical types of tinea capitis and etiological agents are shown in Table 2.

Table 2 Correlation between clinical types and etiological agents

Type of etiological agents	Gray patch	Black dot	Seborrhoeic	Alopecia areata	Pustular type	Kerion	Total (%)
<i>T. violaceum</i>	13	4	1	1	0	0	19 (27.6%)
<i>T. mentagrophytes</i>	3	0	1	1	1	0	6 (8.7%)
<i>T. tonsurans</i>	3	1	0	1	0	0	5 (7.2%)
<i>M. canis</i>	1	0	1	1	0	0	3 (4.3%)
<i>T. rubrum</i>	1	0	1	0	0	0	2 (2.9%)
<i>M. gypseum</i>	0	1	1	0	0	0	2 (2.9%)
<i>M. audouinii</i>	0	1	0	0	0	0	1 (1.4%)
<i>M. nanum</i>	1	0	0	0	0	0	1 (1.4%)
Negative	14	5	4	4	2	1	30 (43.5%)
Total	36	12	9	8	3	1	69 (100%)

Discussion

The incidence of tinea capitis was 4.6% of all dermatophyte infections in the study; a finding similar to that observed in North India,⁶ but contrary to 45% incidence reported from Libya.⁷ Most patients (68%) were children below 11 years of age, as reported in other studies.^{6,7} Four adults (5.8%) had disease in spite of the fungicidal and fungistatic action of adult sebum. In our study, girls were more commonly involved in contrast to other studies.^{6,8}

The disease was more common in a low socioeconomic group (95.7%). Twenty-nine percent of patients had a family history of dermatophytosis and most shared combs and beds with other family members. Seventeen percent of patients bathed only once weekly. These observations support the contention that *T. capitis* is a disease of a low socioeconomic group and the spread of the disease may be owing to sharing inanimate objects. Poor personal hygiene may be a predisposing factor.⁹ One fourth of our patients had other associated fungal infection, similar to other studies.^{7,10}

The clinical types of tinea capitis depend on the pattern of hair invasion by the causative organism, its source, and the host immunologic status.¹¹ In the present study, gray patch was the predominant type, similar to reported observations in Libya⁷ and South India,¹² and in contrast to black dot type, which was the predominate type in North India,⁶ Pakistan,¹³ and southern Taiwan.¹⁴

Kerion was the least common type (1.4%) in our study, which is contradictory to other reports, where it accounted for 20–31% of tinea capitis.^{11,12} This discrepancy may be related to the climate.

Tinea violaceum (48.7%) was the most common species isolated in our series. This is consistent with previous studies, which indicate that it is the most frequent cause in Pakistan,¹¹ southern Taiwan,¹⁴ North India,⁶ and South Africa.¹⁵

Trichophyton mentagraphytes was the second-most common pathogen in the present study, and an occasional isolate in other studies.^{10,11} *Trichophyton tonsurans* is the predominant pathogen of *T. capitis* in the USA,¹⁶ but it accounted for only 12.8% cases in our study.

Previous studies have reported that the clinical presentations are not correctly indicative of the causative fungus or vice-versa, as it also depends on other unknown factors.¹¹ In our study, *T. violaceum*, an anthropophilic fungus, gave rise to only noninflammatory types of tinea capitis, and *T. metagraphytes*, zoophilic and anthrophilic, produced both inflammatory and noninflammatory types of tinea capitis.

To conclude, *T. capitis* is a common infection in young children; low socioeconomic status, less frequent bathing

habits, sharing beds and combs and similar illness in the family may be a few predisposing factors; gray patch type is the most common clinical presentation; and *T. violaceum* is the most common pathogen in this region.

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