

## Original Research Article

# Recurrent and chronic dermatophytosis: culprit-not just antifungal resistance

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### ABSTRACT

**Background:** Recurrent and chronic dermatophytosis is being increasingly seen nowadays. Without drug susceptibility tests, it is difficult to say whether these are due to antifungal resistance or due to other factors.

**Methods:** Hundred dermatophytosis patients, lasting for more than 6 months were enrolled. Detailed history was taken. A clinical examination and KOH preparation was done.

**Results:** Out of total 100 patients, male to female ratio was 61:39. The most common age group was 16-30 years and 31-45 years respectively. Tinea cruris with corporis was the common clinical type (44%) followed by tinea cruris alone (31%) and tinea corporis alone (25%). KOH was positive in 64%. History of delay in consulting doctor was present in 77%, home remedies in 19%, OTC drug usage in 46% among which 69.56% were steroid combined antifungals, treatment by non dermatologists in 52%. Adherence to therapy was seen only in 28%. The common aggravating factors were hot environment (60%), friction, occlusion and during menstruation. Family history of tinea was positive in 66%. No of baths were less than one per day in 8%, sharing of soap and clothing was seen in 41%.

**Conclusions:** Misuse of OTC topical corticosteroids, multiple familial contacts, unhygienic practices, treatment by nondermatologists with inappropriate drug, dose and duration, poor compliance to treatment have all contributed to the emergence of chronic and recurrent dermatophytosis.

**Keywords:** Dermatophytosis, Resistance, OTC drugs, Steroid creams

### INTRODUCTION

Diseases caused by fungi are classified as superficial, subcutaneous and systemic mycosis. Dermatophytosis is one of the common superficial skin diseases affecting millions of people worldwide and is commonly encountered in our OPDs. Dermatophytosis depends on three main factors; host, agent and environment. Hot and humid environment, few fungal species and immunosuppression of the host favours the fungal proliferation. There is an unprecedented increase in the number of recurrent and chronic tinea infections in recent

years.<sup>1</sup> There is a changing trend in the dermatophytic infections in that the cases are presenting as chronic, treatment unresponsive and recurrent cases. This has been attributed to misuse of inexpensive easily available OTC combination creams containing steroids, inappropriate drug, dosage or duration, host factors like noncompliance or immunosuppression. Dermatophytosis is considered to be chronic when the patients have suffered from the disease for more than 6 months to 1 year, with or without recurrence, in spite of being adequately treated.<sup>2</sup> Dermatophytosis is considered to be recurrent when there

is re-occurrence of the disease (lesions) within few weeks (<6 weeks) after completion of the treatment.<sup>2</sup>

These patients are a potential source of infection to their family members and others closely associated with them. Various mechanisms contributing to chronicity and recurrences have been proposed but the exact reasons have not been elucidated.<sup>3</sup> In the absence of drug susceptibility tests and studies, it is difficult to say whether these recurrences and chronicity are due to true resistance to antifungals or are due to other associated factors.

**Aims**

Aims of the current study were; to know the epidemiology and clinical profile of recurrent and chronic dermatophytosis and to evaluate the possible risk factors in the emergence of recurrent and chronic dermatophytosis in recent times.

**METHODS**

This observational study was conducted at Belagavi institute of medical sciences, from October 2019 to March 2020. 100 clinically diagnosed cases of tinea who were suffering for more than 6 months with or without recurrences were included in the study after taking informed written consent. People with immune compromised state or on immunosuppressive drugs were excluded. Detailed history about the disease was elicited, clinical examination was done and skin scrapings were sent for KOH examination. The results thus obtained were analysed using various statistical methods like percentage, frequencies and represented using tables and charts.

**Statistical analysis**

Data was entered into Microsoft excel data sheet and was analyzed using SPSS 22 version software. Categorical data was represented in the form of percentages. MS excel, SPSS version 22 was used to analyze the data.

**RESULTS**

Out of the 100 patients studied, 61% were females and 39% were males. Age group varied from 14-58 years (mean age, 29.07 years). Age group variation is shown in the (Table 1).

**Table 1: Age group distribution of patients.**

Age group (years)	Males (%)	Females (%)
0-15	1	1
16-30	23	26
31-45	9	27
46-60	6	7

The most common age group affected in males was 16-30 years and among females 31-45 years. Itching was the most common complaint. The duration of the complaint varied from 6 months to >2 years (Table 2).

**Table 2: Duration of the disease.**

Duration of the disease	Percentage
6 months to 1 year	68
1-2 years	29
>2 years	3

Various clinical types of tinea is shown in (Table 3). The most common clinical type was tinea cruris with corporis (44%), followed by tinea cruris alone (31%), tinea corporis alone (25%), tinea faciei (8%), tinea unguim (6%), tinea barbae (3%), tinea pedis (2%) and tinea mannum (1%) (Figure 1-2). KOH mount done using 10% KOH was positive for fungal elements in 64% (Figure 3).

**Table 3: Clinical types of tinea.**

Clinical type of tinea	Percentage
Tinea cruris with corporis	44
Tinea cruris	31
Tinea corporis	25
Tinea facie	8
Tinea unguim	6
Tinea barbae	3
Tinea pedis	2
Tinea mannum	1



**Figure 1: Various clinical types of tinea; A) tinea incognito, B) tinea pseudoimbricata, C) inflammatory tinea cruris and D) tinea corporis.**

77% of the patients gave a history of delay in seeking medical help ranging from 2 weeks to 2 months. 19% of the patients had used home remedies in the form of oil, camphor or other irritants for their complaints before consulting doctors. Use of OTC drugs was seen in 46%. Out of which topical antifungal comprised 13.04%,

steroid combined antifungal 69.56% and unknown medications in 17.39% (Table 4).



**Figure 2: A) Tinea cruris with corporis and tinea faciei.**

**Table 4: OTC medication usage in patients.**

Type of OTC creams used	Percentage
<b>Steroid combined antifungals</b>	69.56
<b>Topical antifungals</b>	13.04
<b>unknown</b>	17.39

52% patients were previously treated by non dermatologists, 44% by dermatologists and 4% by quacks. Among them, 44% were treated with oral and topical antifungals, 35% were treated with topical antifungals alone and in 21% of patients it was steroid combined antifungals (Table 5).

**Table 5: Previous treatment details of patients.**

Treatment received	Percentage
<b>Oral and topical antifungals</b>	44
<b>topical antifungals alone</b>	35
<b>Steroid based creams</b>	21

Only 28% were adherent to treatment, were aware of the nature of the disease, modes of spread and duration of therapy. The most common reason given for non adherent to treatment was no/partial improvement to treatment (53%) followed by financial issues (31%), unawareness of duration of therapy (11%) and others (4%) (Table 6).

**Table 6: Reasons for non adherence to therapy.**

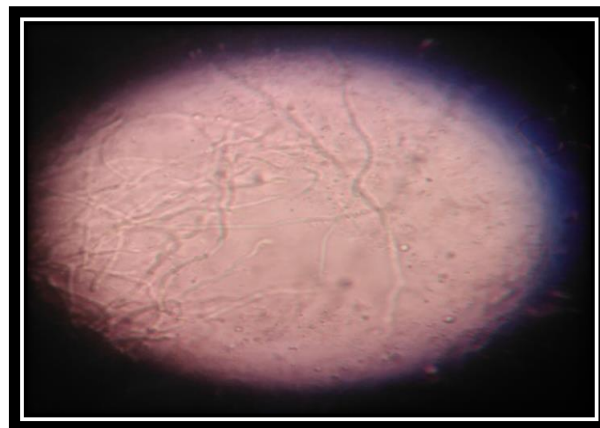
Reasons	Percentage
<b>No/partial improvement</b>	53
<b>Financial issues</b>	31
<b>Unawareness of duration of treatment</b>	11
<b>Others</b>	4

The symptom free period between two episode of the disease was <1 month in 72%, 1-3months in 26%, 3-6 months in 2%. The various other risk factors studied are shown in (Table 6). The common aggravating factors were hot and humid environment in summers (60%), friction, occlusion and during menstruation. Family

history of tinea was positive in 66%, out of which only 42% of the affected family members were on treatment simultaneously. No of baths were less than one per day in 8%, one per day in 77%, more than one per day in 15%. Sharing of soaps, towels or other clothings were seen in 41%. Use of wet undergarments was seen in 16% and occlusive clothes like jeans, leggings were seen in 42% (Table 7).

**Table 7: Risk factors assessed.**

Risk factors assessed	Percentage
<b>Seasonal exacerbation</b>	60
<b>Family history of tinea</b>	66
<b>Bathing &lt;1 per day</b>	8
<b>Sharing of soap/clothes/footwear</b>	41
<b>Use of wet undergarments</b>	16
<b>Use of occlusive clothes</b>	42



**Figure 3: Microscopy of KOH preparation showing fungal hyphae.**

**DISCUSSION**

Dermatophytic infections are widespread and cause significant distress to the patients socially, emotionally and financially. Recurrent and chronic dermatophytosis is emerging fast as a challenge to dermatologists in India.<sup>3</sup>

In current study, females outnumbered males unlike in other study and the most common population was young adult males and middle aged females which correlated with a study done by Dogra et al.<sup>4</sup> Tinea cruris with corporis was the most common clinical type associated with chronicity and recurrence in our study unlike that of other studies where in tinea corporis and the mixed (tinea corporis, cruris, faciei, pedis and mannum) infections were the most common types.<sup>4,5</sup>

Overcrowding and low socioeconomic status were correlated with chronicity. There were multiple affected family members (66%) but all were not on treatment simultaneously. We also observed frequent sharing of soap, towel, footwear and clothes among family members

in our patients. This could contribute to the spread of infection. Objects such as clothing, bed sheets and towel harbour the fungal pathogens and are capable of transmitting the disease among family members. In addition, fungal spores remain viable for months in household dust leading to recurrent episodes of clinical disease.<sup>6,7</sup> Asymptomatic carriers among family members may also be another cause for recurrence. Most of patients wore tight clothes (42%) like in other studies (51%) such as jeans, leggings and wet under clothings which were often unwashed for days creating a favourable environment for proliferation of fungi.<sup>4</sup> Majority of the patients experienced recurrences within 1 month of stopping the therapy which is in concordance with the study done by Dogra et al.<sup>4</sup>

Few of the patients gave a history of delay in consulting a doctor, during which they tried various remedies like oil, camphor etc which led to change in the morphology of the lesions, proliferation of fungi and thus increased the duration of therapy. Early lesions were neglected by many patients where as chronicity compelled them to seek medical advice. Early initiation of therapy would help to keep a check on the proliferation of the fungi and hence decreases the transmission to other family members and drastically brings down the total duration of the disease. Majority of the patients had used topical corticosteroids either alone or in combination with antibacterials and antifungals for varying period of time before presentation. Patients tried easily available, less expensive OTC drugs, most of which were polypharmacy containing steroids, which gave them a temporary relief of symptom. Corticosteroids containing topical applications suppress inflammation and improve signs and symptoms of tinea initially. However dermatophytes flourish leading to subsequent flare up of the disease.<sup>8</sup> Patients need not always seek dermatologists for their skin complaints and hence tends to get treated with inadequate dose and duration of antifungals which may results in chronicity and recurrences. Irrational use of topical and systemic antifungal medications either alone or in combination with easily available over the counter steroid or antibacterial agents are contributing to the emergence of recurrent dermatophytosis.

The infections are predominant in tropical/subtropical countries like India, with hot and humid environment. The recurrence was more common during summer and during menstruation in our study which is in concordance with previous study.<sup>4</sup> KOH mount showed positivity in 64% which is similar to (64-79%) other previous studies.<sup>9,10</sup> Adherence to therapy is a very important factor in treating these patients. Patients tend to stop treatment on their own due to various reasons like partial/no symptomatic improvement, high cost of the therapy, longer duration of the treatment etc which results in incomplete clearance of the infection, fungal proliferation and familial spread. So educating and counseling the patients regarding the duration of therapy,

modes of spread and risk factors associated forms a major part of tinea treatment.

### **Limitations**

The main limitation of the study was inability to get fungal culture and perform susceptibility test to know antifungal resistance.

### **CONCLUSION**

Chronicity and recurrence of tinea infection need not always be purely due to antifungal resistance, there are various other risk factors associated such as irrational use of OTC drugs, topical steroids, multiple affected family members, noncompliance to therapy, unhygienic practices and suboptimal dose and duration of antifungals. These issues need to be addressed while treating patients in clinical practices.

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