

## RECENT ADVANCEMENTS IN UNDERSTANDING THE GENESIS AND TREATMENT OF DERMATOPHYTOSIS: A COMPREHENSIVE OVERVIEW

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### ABSTRACT

Tinea corporis is one of the most commonly fungal known illness resembling several different annular lesions. The usual presentation of tinea corporis is a well-defined, precisely outlined, circular or oval, scaly plaque or patch with slightly erythematous, with an elevated leading edge. Commonly, pruritus is mild. Although the prognosis is frequently clinical, it may be challenging if you've taken corticosteroids or calcineurin inhibitors in the past. A practical and non-invasive diagnostic method is dermoscopy. If required, microscopic analysis of KOH mounted wet preparations of scraped skin from the lesion's active border can be used to confirm the diagnosis. The most reliable method for diagnosing dermatophytosis is fungus culture, particularly when other test findings are unclear, the illness is severe, extensive, or resistant to therapy. Medical professionals need to get knowledgeable about this illness and how to treat it. The purpose of this paper was to present a narrative, up-to-date overview of tinea corporis examination, diagnosis, and therapy.

**KEYWORDS:** Dermatophytosis, Ringworm, Fluconazole, Itraconazole.

### INTRODUCTION

Tinea corporis, commonly referred to "ringworm," is a skin ailment caused by dermatophytes. It should be noted that tinea corporis is distinct from other types of infections such as tinea manuum, tinea pedis, tinea capitis, tinea barbae, onychomycosis, and infections in the bearded regions, face, groin, and nails. The user's text is (1). Dermatophytes is the most common cause of tinea corporis is, which belong to one of three genera: Epidermophyton, responsible for infections on the skin and nails; on the other hand Microsporum, responsible for infections on the hair and skin; and Trichophyton is responsible for infections on the skin, hair, and nails. The user's text is (2-3). They can be categorized as zoophilic, geophilic depending on the primary source, which are predominantly soil, humans, or animals, respectively. The user's text is (4).

### Epidemiology of dermatophytosis in India

The affected population from dermatophytosis is around 20-25% of the globally and is a common infectious skin condition in medical settings. The text is referenced by the number (5). In India, a formerly perceived benign and readily manageable ailment in

tropical and subtropical areas, primarily occurring in the seasons of rain and summer, has now transformed into a chronic and formidable illness. Recent studies have shown a rise in dermatophytosis prevalence during the previous ten years nationwide, with a particularly notable rise in the last five to six years. The user's text is a numerical range from (6-7), inclusive. The country is currently facing situations that resemble an epidemic due to the alarming rate of increase. The user's text is (8).

### Prevalence and Incidence

Although there have been numerous studies on superficial dermatophytosis, the absence of community-based surveys makes it difficult to accurately assess the incidence and prevalence. The reported prevalence in India currently exhibits a significant range, from 6.09% to 61.5%. Studies conducted in southern India have reported a frequency ranging from 6.09% to 27.6% (9-10), whereas in northern India, a significantly higher incidence of 61.5% has been seen (11). The majority of this data is derived from hospital-based research conducted over one to two-year periods 6-9. Contrary to predictions, there is no apparent difference in the prevalence of

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dermatophytosis between south India's hot and humid environment and north India. Based on the existing data, it can be inferred that the prevalence of dermatophytosis has escalated nationwide in the past 5-7 years.

Furthermore, there is a noticeable and continuous increase in the frequency of chronic, relapsing, and recurring dermatophytosis, with periods of sickness lasting for months or even years being quite common. In 2014, an illness lasting more than 3 months was documented in 163 out of 300 patients, accounting for 62.5% of the total. The user's text is a numerical value, specifically the number 12. Out of the total of 300 patients, 28 individuals (9.3%) had experienced comparable occurrences in the past, while 87 patients (27.7%) had received treatment with medications other than antifungal agents before. Subsequently, The frequency of recurrent and relapsing dermatophytosis has been on the rise. (Table 1) The user's text is (9-16).

the skin's sebaceous layer and spread, the causative fungus can secrete proteases, Serine proteases and keratinases. Enzymes classified as proteases break down keratin, whereas serine proteases use a serine residue in the active site to start a nucleophilic assault on peptide bonds. Keratinases, on the other hand, break through keratinized tissue. (The academic year 2021-2022) Infections that affect the skin are often limited to the outermost layers, which are non-living and hardened. The user's text is (21). In healthy individuals, the fungus is unable to enter deeper tissues with a strong immune system due to the activation of host defense mechanisms such as complements, polymorphonuclear leukocytes, and serum inhibitory factor. The fungal infection induces heightened proliferation of epidermal cells, resulting in the formation of scales along the active boundary. The user's text is (22).

Place of study	Standard deviation of recurrence	Standard deviation for reinfection (%)	Total patients
Sikkim	60.4%	34.3%	192
Chandigarh		9.3% (multiple recurrences, (3–10) usually within a few days to 4weeks of stopping treatment)	150
Varanasi	Chronic-65.3%	34.6%	150
Varanasi	Disease duration of 2 years-35.8%		265
Jaipur	9.3% (Disease duration >3 months-62.5%)		300
New Delhi	Recalcitrant-44.3%	49%	300
Kottayam	Chronic-68%		120
Chandigarh		60%	195

**Table 1: Rates of recurrence and Relapse in Dermatophytosis**

### Pathogenesis

*T. rubrum* and certain other dermatophytes possess mannans in their cell walls that exhibit immune-suppressive properties. The user's text is (20). Consequently, the fungus can persist on the skin without shedding prior to infiltrating it. To penetrate

### Pathophysiology

Individuals with decreased levels of defensin beta 4 may have a preference for all types of dermatophytes. Additional risk factors include a compromised immune system, Cushing syndrome, diabetes mellitus, lymphomas, excessive sweating, or

advanced age. It is widely agreed that dermatophytosis is caused by an immunological response that is controlled by cells. Individuals vary in their susceptibility to fungal infections, which can be influenced by genetic and familial predispositions, as well as specific vulnerabilities in their innate and adaptive immunity (23).

### Symptoms

Symptoms include :

- A ring-shaped patch of scales that usually appears on the arms, buttocks, legs and trunk.
- Itchiness, an itchy skin flat patch that is round.
- A region inside the ring that is clear or scaly, sometimes having a few sporadically spaced lumps that vary in hue from red on white skin to reddish, purple, brown, or gray on skin that is black or brown. expanding, slightly elevated rings Rings that overlap.

### Prognosis

The clinical diagnosis of tinea corporis is often established following a thorough physical examination and a complete review of the patient's medical history. Tests might be conducted to verify the diagnosis. Scraped skin upon examination through a microscope using a prepared potassium hydroxide (KOH), one can observe elongated and thin hyphae that are both segmented and branched. Nevertheless, relying solely on KOH preparations for diagnosis may lead to false negatives in approximately 15% of cases. The user's text is (24).

Thus, a fungal culture offers an extra method of verification. Fungal cultures, even if fully developed, require a certain amount of time to be definitively recognised. The growth of cultures can be observed within a span of five days, although in particular species, this process may extend up to four weeks. Consequently, it is necessary to assess a sample for the absence of any growth for a minimum duration of four weeks. The most commonly utilized medium for isolating fungal cultures is Sabouraud dextrose agar, which consists of a combination of 1% glucose, 4% mycological peptone agar, and water. The examination of the culture involves analysing its morphology, coloration, and surface topography for the purpose of identification (25).

### Treatment/Management

Dermatophyte infections are commonly treated with topical or oral medications. Typically, applying for topical medicine twice or once daily for a duration of 2-3 weeks is highly effective in treating localised tinea corporis. However, the objective of treatment is to

achieve a clinical remission of the symptoms. Tinea corporis is often unresponsive to topical nystatin therapy. The user's text is (24). The subsequent topical regimens are recommended: Clotrimazole should be applied topically twice a day using a 1% cream, ointment, or solution. Ketoconazole: Apply a 2% cream, soap, gel, or foam one time daily. Miconazole should be applied twice daily in the form of a 2% cream, ointment, solution, lotion, or powder. The drug Naftifine can be delivered in the form of a 1% gel or 1% or 2% cream, and should be applied 2 times daily, also Terbinafine should be applied topically once or twice a day using a 1% cream, gel, or spray solution.

If the topical treatment proves ineffective or if the infection is widespread, oral medicine becomes necessary. Oral terbinafine or itraconazole are commonly recommended as the initial treatment, typically resulting in the resolution of the disease within a period of two to three weeks. Recommended oral treatment options for adults includes: Terbinafine: Administer 250 mg orally once daily for a duration of 2 weeks. Another medicine Itraconazole should be taken 1 time daily with meals for a duration of 2 weeks. The recommended dosage is either 100 mg or 200 mg per capsule. The recommended dosage of 50-100 mg/day of Fluconazole for a duration of 2-4 weeks, or a single dose of 150-200 mg once a week. The recommended dosage of Griseofulvin is 500-1000 mg taken once day for a duration of two to four weeks.

### Differential Diagnosis

The conditions within the diagnosis categorized differential may exhibit a similar appearance to tinea corporis. These instances often exhibit annular lesions. Further investigation is required for cases that do not demonstrate improvement with antifungal therapy or yield negative results on a potassium hydroxide microscopic examination. Furthermore, in the case of a severe sickness, such as extensive skin involvement, the doctor must eliminate the possibility of other, potentially more perilous conditions. The user's text is (26).

Disorders sharing similar symptoms include:-

- Atopic, dermatitis contact or seborrheic
- rythema annular centrifugum,
- psoriasis,
- cutaneous candidiasis,
- subacute cutaneous lupus erythematosus
- tinea versicolor

Among the crucial illnesses that need to be ruled out are secondary mycosis fungoides, and para psoriasis. syphilis.

## CONCLUSION

*Tinea corporis* a causative agent for dermatophytosis is one of the most spread skin disease in North Indian population. Due to its infectious nature, it may have serious consequences for one's social, psychological, and occupational health. The user's text is (28) and is usually defined as an circular or oval in shape which can be a scaly patch or plaque and it can little erythematous, with an elevated leading edge. Scratching and skin abrasion might result in a subsequent bacterial infection that can lead to both hyperpigmentation and hypopigmentation following an inflammation may happen. Patients with this condition often develop maculopapules, papulovesicles, pustules, or extensive, very itchy, erythematous, scaly papules. The dermatitis eruption is most likely an immunologic response, similar to a type IV delayed hypersensitivity reaction, to the fungal antigen. The precise preventer measure is not yet defined but certain calcineurin inhibitors and corticosteroids is most practiced medications.

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## Disclosure statement

The authors affirm the absence of any conflicting financial interests or other conflicts.

## Availability of data

The authors verify that the data substantiating the conclusions of this study may be found in the journal itself or its additional resources.

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