

Comprehensive overview of athlete's foot: A common dermatophyte infection of the feet

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Abstract

Athlete's foot, also referred to as Tinea pedis, is a superficial fungal infection caused by dermatophytes that primarily affects the skin of the feet. It is among the most common mycotic infections globally, with increased prevalence in hot and humid environments. The condition is most commonly attributed to *Trichophyton rubrum* and can manifest in multiple clinical variants. Although generally not life-threatening, tinea pedis may become persistent, prone to recurrence, and may lead to secondary bacterial infections in certain cases. This review discusses the underlying pathophysiology, diverse clinical presentations, diagnostic techniques, therapeutic interventions, and preventive strategies associated with this common dermatophyte infection.

Keywords: Tinea pedis, athlete's foot, dermatophytes, fungal infection, antifungal therapy, dermatology

Introduction

Tinea pedis is a superficial fungal infection of the skin of the feet caused by dermatophytes, with *Trichophyton rubrum* being the most common pathogen [1]. The infection typically involves the interdigital spaces, soles, and sometimes the dorsal aspect of the feet. It commonly affects adults, especially males, and is associated with factors such as occlusive footwear, communal bathing areas, and underlying immunocompromised states [2].

Epidemiology

Tinea pedis has a global prevalence of 15–25% [3], with higher rates in tropical and subtropical regions. It is more common in adults than children, and men are affected more frequently than women [4]. Risk factors include:

- Wearing tight, non-breathable footwear
- Hyperhidrosis
- Sharing shoes or walking barefoot in communal areas
- Diabetes mellitus and immunosuppression [5]

Etiology and Pathogenesis

Dermatophytes are fungi that infect keratinized tissues. The primary organisms responsible are:

- *Trichophyton rubrum*
- *Trichophyton interdigitale*
- *Epidermophyton floccosum* [6]

These organisms produce keratinases and proteases that allow them to invade the stratum corneum. Transmission occurs via direct contact with contaminated surfaces, fomites, or person-to-person. The moist environment inside footwear contributes to fungal proliferation [7].

Clinical Manifestations

Tinea pedis has several distinct clinical types:

1. Interdigital Type

The most common form, characterized by maceration, scaling, and fissuring between the toes, typically the fourth and fifth [8].

2. Moccasin-Type (Hyperkeratotic)

Presents as chronic, diffuse scaling and erythema on the soles and sides of the feet, often involving both feet symmetrically [9].

3. Vesiculobullous Type

Characterized by sudden eruption of pruritic vesicles or bullae, usually on the medial plantar surface [10].

4. Ulcerative Type

A rare but severe form, featuring erosions, weeping lesions, and secondary bacterial infection, often seen in immunocompromised patients [11].

Diagnosis

a. Clinical Diagnosis

Often based on appearance and patient history. Pruritus, scaling, fissures, and malodor are typical features [12].

b. Laboratory Diagnosis

- **KOH Preparation:** Demonstrates fungal hyphae.
- **Fungal Culture:** Identifies specific organism and is useful for recurrent or resistant cases.
- **Histopathology:** Occasionally required in atypical or recalcitrant presentations [13].

Differential Diagnosis

Tinea pedis may resemble other dermatoses, such as:

- Dyshidrotic eczema
- Psoriasis
- Contact dermatitis
- Pitted keratolysis
- Bacterial intertrigo [14]

Accurate diagnosis is important to avoid unnecessary or ineffective treatment.

Treatment

1. Topical Antifungals

Recommended for mild to moderate infections. Effective agents include:

- Azoles (e.g., clotrimazole, miconazole)
- Allylamines (e.g., terbinafine, naftifine)
- Ciclopirox olamine ^[15]

Treatment is applied twice daily for 2–4 weeks and should continue at least one week after symptom resolution.

2. Systemic Antifungals

Reserved for extensive, chronic, or refractory cases:

- **Terbinafine:** 250 mg once daily for 2–4 weeks
- **Itraconazole:** 100–200 mg daily for 2–4 weeks
- **Fluconazole:** 150 mg weekly for 4 weeks ^[16]

Adjunctive Measures

- Keeping feet dry and clean
- Using antifungal powders
- Avoiding occlusive footwear
- Rotating shoes and changing socks regularly ^[17]

Complications

- Secondary bacterial infections (e.g., cellulitis)
- Id reactions (dermatophytid)
- Spread to nails (onychomycosis)
- Chronic and recurrent infection ^[18]

Prevention

Preventive strategies include:

- Maintaining foot hygiene
- Wearing breathable footwear
- Avoiding barefoot walking in public showers or locker rooms
- Using protective footwear in communal areas ^[19]

Conclusion

Tinea pedis is a common dermatological condition with a significant impact on quality of life. Prompt recognition, effective antifungal treatment, and appropriate hygiene measures are essential for successful management. Recurrence can be minimized by addressing predisposing factors and educating patients on preventive strategies.

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