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**PREVENTION OF TINEA PEDIS IN PUBLIC PLACES: ETIOPATHOGENESIS AND  
HYGIENIC IMPERATIVES**

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**ABSTRACTS:** Background: Tinea pedis ("Athlete's foot") is the most prevalent fungal infection worldwide, primarily transmitted in communal wet environments. In the Fergana Valley, the increasing popularity of swimming pools, fitness centers, and the high usage of communal ablution areas creates a conducive environment for dermatophyte transmission. Objective: This study aims to investigate the prevalence and etiopathogenesis of Tinea pedis among visitors of public facilities in Andijan and to define hygienic imperatives for effective prophylaxis. Methods: A cross-sectional study involving 450 regular visitors to public swimming pools, gyms, and communal ablution facilities was conducted. Clinical samples were analyzed using microscopy (KOH mount) and culture on Sabouraud dextrose agar. Risk factors were assessed via a structured questionnaire regarding hygienic habits. Results: Clinical signs of Tinea pedis were identified in 28.4% of participants. The highest prevalence was observed among swimming pool users (34%) and frequenters of communal ablution areas (26%). *Trichophyton rubrum* was the dominant pathogen (72%), followed by *T. interdigitale* (21%). Key risk factors included walking barefoot on wet surfaces (OR=3.5) and failure to dry interdigital spaces (OR=2.8). Conclusion: Public places with high humidity serve as major reservoirs for pathogenic fungi. Effective prevention requires a multi-level approach: strict disinfection protocols for facilities and personal hygienic imperatives such as wearing protective footwear and thorough foot drying.

**Keywords:** Tinea pedis, dermatophytes, public health, hygiene, swimming pools, *Trichophyton rubrum*, Andijan.

## INTRODUCTION

Tinea pedis, commonly referred to as "athlete's foot," is a superficial fungal infection of the glabrous skin of the feet. It represents the most frequent form of dermatophytosis globally, affecting approximately 15–25% of the general population. While historically considered a nuisance, Tinea pedis is now recognized as a significant public health issue due to its potential to cause secondary bacterial infections (cellulitis), onychomycosis (nail infection), and significant morbidity in diabetic/immunocompromised patients.

The epidemiology of Tinea pedis is intrinsically linked to modernization and communal living habits. The causative agents, anthropophilic dermatophytes, thrive in warm, humid environments. Consequently, public facilities such as swimming pools, saunas, fitness centers (gyms), and communal ablution rooms (tahoratxona) serve as high-risk reservoirs for transmission [3]. In Uzbekistan, where community gatherings and religious observances involving ablution are integral parts of social life, understanding the transmission dynamics in these specific settings is crucial [4].

This article explores the etiopathogenesis of Tinea pedis, analyzes its prevalence in public spaces in Andijan, and proposes strict "hygienic imperatives"—mandatory preventive measures—to curb its spread.



## **ETIOPATHOGENESIS**

Causative agents - The primary etiological agents isolated in our region are:

*Trichophyton rubrum* (approx. 70%) - Causes chronic, dry, hyperkeratotic (moccasin-type) infections. It is notorious for its ability to suppress the host's immune response via the production of mannans in its cell wall, leading to chronic, recalcitrant infections. *Trichophyton mentagrophytes* var. *interdigitale* (approx. 20%) - Often associated with acute, inflammatory, and vesicular types of infection.

*Epidermophyton floccosum* - Less common but highly contagious.

Pathogenic Mechanism - The infection process follows a specific sequence: 1) Arthrospores (infectious fungal elements) shed from an infected host's skin onto floors/mats adhere to the keratinocytes of a new host. Moist skin significantly enhances this adherence. 2) The fungi secrete keratinases (enzymes) that digest keratin, allowing hyphae to penetrate the stratum corneum. 3) The host's immune system responds to metabolic byproducts, causing pruritus (itching), erythema (redness), and vesiculation. However, *T. rubrum* can often evade this response, leading to asymptomatic carriage known as "occult tinea pedis," which makes these individuals dangerous "super-spreaders" in public places.

## **MATERIALS AND METHODS**

Study setting - The study was conducted by the Department of Dermatovenereology at Andijan State Medical Institute (2020–2024). We surveyed three types of public facilities in Andijan city: Group A - Indoor Swimming Pools (n=150 visitors). Group B - Fitness Centers/Gyms (n=150 visitors). Group C - Communal Ablution Areas (n=150 visitors).

Methodology - Participants underwent a clinical foot examination. Skin scrapings were collected from the interdigital spaces (between the 4th and 5th toes) and plantar surfaces. Samples were subjected to: Direct Microscopy - 10% KOH solution to visualize fungal hyphae. Culture - Inoculation on Sabouraud Dextrose Agar (SDA) with cycloheximide to identify species.

A questionnaire evaluated hygienic habits: frequency of visits, use of personal footwear (flip-flops), and foot drying practices.

## **RESULTS**

Prevalence by location The overall prevalence of culture-confirmed Tinea pedis was 28.4% (128/450). Swimming Pools (Group A): Highest prevalence at 34.0%. The constantly wet decks and shared walking surfaces facilitate rapid arthrospore transfer. Ablution Areas (Group C): Prevalence of 26.0%. High traffic and humidity, combined with the ritual necessity of bare feet, contribute to risk if wooden lattices or carpets are not disinfected. Gyms (Group B): Prevalence of 25.3%. Occlusive footwear (sneakers) and shared locker room floors were primary drivers.

Interdigital type (55%) - Maceration and fissuring between toes. Most common in Group A and C due to moisture. Hyperkeratotic Type (35%) - Dry scaling on soles ("Moccasin foot"). Most common in Group B. Vesicular Type (10%) - Small blisters, associated with acute flares. Walking Barefoot - Participants who reported "always" walking barefoot in locker rooms/pool decks had a 3.5 times higher risk of infection compared to those using rubber slippers.

Drying habits - Failure to dry the interdigital spaces after washing was significantly associated with infection (OR=2.8).

## **DISCUSSION**



Our findings confirm that public places in Andijan are significant reservoirs for *Tinea pedis*. The isolation of *T. rubrum* as the dominant pathogen aligns with global trends.

The "Invisible" Threat - A concerning finding was that nearly 40% of culture-positive individuals reported mild or no itching. These asymptomatic carriers continue to visit public places, shedding infectious scales. This highlights that visual inspection alone is insufficient for control [5].

Environmental Persistence - Dermatophyte arthrospores can survive in exfoliated skin scales for months in the environment. Wooden surfaces (often found in saunas or older ablution areas) and carpets are particularly difficult to disinfect and can harbor fungi for long periods.

## CONCLUSION

Conclusion and hygienic imperatives - To prevent the spread of *Tinea pedis*, a paradigm shift from individual treatment to community hygiene is required. We propose the following Hygienic Imperatives: usage of personal waterproof footwear (flip-flops/sliders) must be mandatory in all "wet" zones of public facilities (locker rooms, showers, pool decks, ablution corridors).

Replace wooden lattice floorings with non-porous, easily disinfectable materials (plastic/rubber mats).

Implement daily disinfection of floors with antifungal agents (e.g., sodium hypochlorite).

Fungi cannot survive desiccation. Thoroughly drying the feet, especially between the toes, using a personal towel or disposable paper tissues is the single most effective preventive measure after washing.

Regular visitors to high-risk areas should consider using topical antifungal sprays or powders profilactically once a week.

Public health authorities should mandate regular mycological monitoring of surfaces in public water facilities and conduct educational campaigns on foot hygiene.

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