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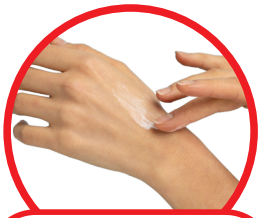

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REVIEW ARTICLE

Oxiconazole: A Comprehensive Review on its Role in Superficial Fungal Infections

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ABSTRACT

Oxiconazole is a topical antifungal medicine that belongs to the imidazole group. It is mainly used to treat superficial fungal infections of the skin. It works well against different types of fungi, including dermatophytes (which cause skin infections), *Candida* species (a type of yeast), and some Gram-positive bacteria. Health care professionals commonly use oxiconazole to treat conditions like athlete's foot (tinea pedis), ringworm of the body (tinea corporis), and tinea versicolor (a skin infection that causes discolored patches). Oxiconazole mainly stops fungi from growing (fungistatic effect), but at higher doses, it may kill them directly (fungicidal effect). It works by blocking the production of ergosterol, an essential part of the fungal cell membrane. Without ergosterol, the membrane becomes weak and leaky, disrupting normal cell function. This review highlights oxiconazole's mode of action, range of antifungal activity, clinical uses, resistance patterns, and safety. It shows why oxiconazole remains a valuable option in treating skin fungal infections.

Keywords: Oxiconazole, antifungal, fungistatic, fungicidal

Superficial fungal infections, also known as dermatophytosis or tinea, are prevalent skin conditions globally, particularly in tropical and subtropical regions. They are caused by fungi that feed on keratin, a protein found in the outer layers of the skin, as well as in the hair and nails[1,2].

THE GLOBAL BURDEN OF FUNGAL INFECTIONS

Fungi cause different infections in humans, affecting over a billion people worldwide. These infections can be mild, like skin allergies, or severe and life-threatening, like invasive fungal infections (IFIs)[3,4].

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Superficial fungal infections affect approximately 20%-25% of the global population and are associated with significant morbidity, particularly when accompanied by an inflammatory response. Accurately measuring the prevalence of these infections is difficult because of the limited diagnostic tools available. However, recent estimates suggest that around 6.5 million IFIs occur each year, leading to about 2.5 million deaths. This depicts the severe impact of fungal infections on global health. Hence, it becomes essential to understand the mechanism, causes, signs, and different treatment modalities[5,6].

INDIAN SCENARIO

The occurrence of these infections varies by region and population, depending on factors like climate income levels, and cultural habits. In tropical and subtropical areas, such as India, these infections are especially widespread due to the hot and humid weather, which helps the fungi grow[7].

Studies have shown that around 20%-25% of the general population may be affected. The most frequent types are tinea corporis (body) and tinea cruris (groin)[5,8]. These infections often appear as itchy, red, scaly patches, or plaques with a ring-like shape. In some cases, they may also cause nail changes or damage (nail dystrophy)[8].

Diagnosis is usually made by clinical examination, based on how the skin lesions look. Key risk factors

included poor hygiene, tight or non-breathable clothing, and obesity and other immunocompromised status in individuals[9].

A recent review estimated that 4.1% of India's population is affected by serious fungal infections, with tinea capitis (scalp ringworm) affecting about 2.5 million school-age children[10,11].

A study from a rural area reported a 27.6% prevalence of superficial fungal infections among people with suspected cases, and dermatophytosis made up 75.6% of these infections. Studies show that tinea corporis, a common form of body fungal infection, is the most frequently observed presentation (41.0%), followed by tinea cruris (31.0%), and tinea pedis (15.0%)[5,11].

SPECIFIC CHALLENGES IN MANAGING FUNGAL INFECTIONS IN HUMANS

Fungal infections pose significant challenges (Fig. 1) due to their increasing incidence and drug-resistant strains, making prevention, diagnosis, and treatment more complex. Limited treatment options and compromised immune systems further complicate the situation. Drug resistance, especially in IFIs, further complicates treatment. Raising awareness is crucial for improving early diagnosis and treatment outcomes and preventing delays in managing fungal infections[3].

Several major challenges make the prevention, diagnosis, and treatment of fungal infections difficult. These are outlined in Figure 2.

Dealing with these challenges involves an overall comprehensive approach, including awareness campaigns, tracking and using advanced diagnostic tools, strengthening monitoring systems, ensuring appropriate use of antifungal treatments, and targeting high-risk populations.

PREDISPOSING FACTORS AND PATHOGENESIS OF DERMATOPHYTOSES[12,13]

- **Host factors:** Immunosuppression, diabetes, lymphoma, chronic disease, and genetics.
- **Anatomical sites:** Groin, axilla, and web spaces.
- **Triggers:** Sweating, friction, and alkaline pH.
- **Environmental factors:** High humidity, urban living, and tight/occlusive clothing.

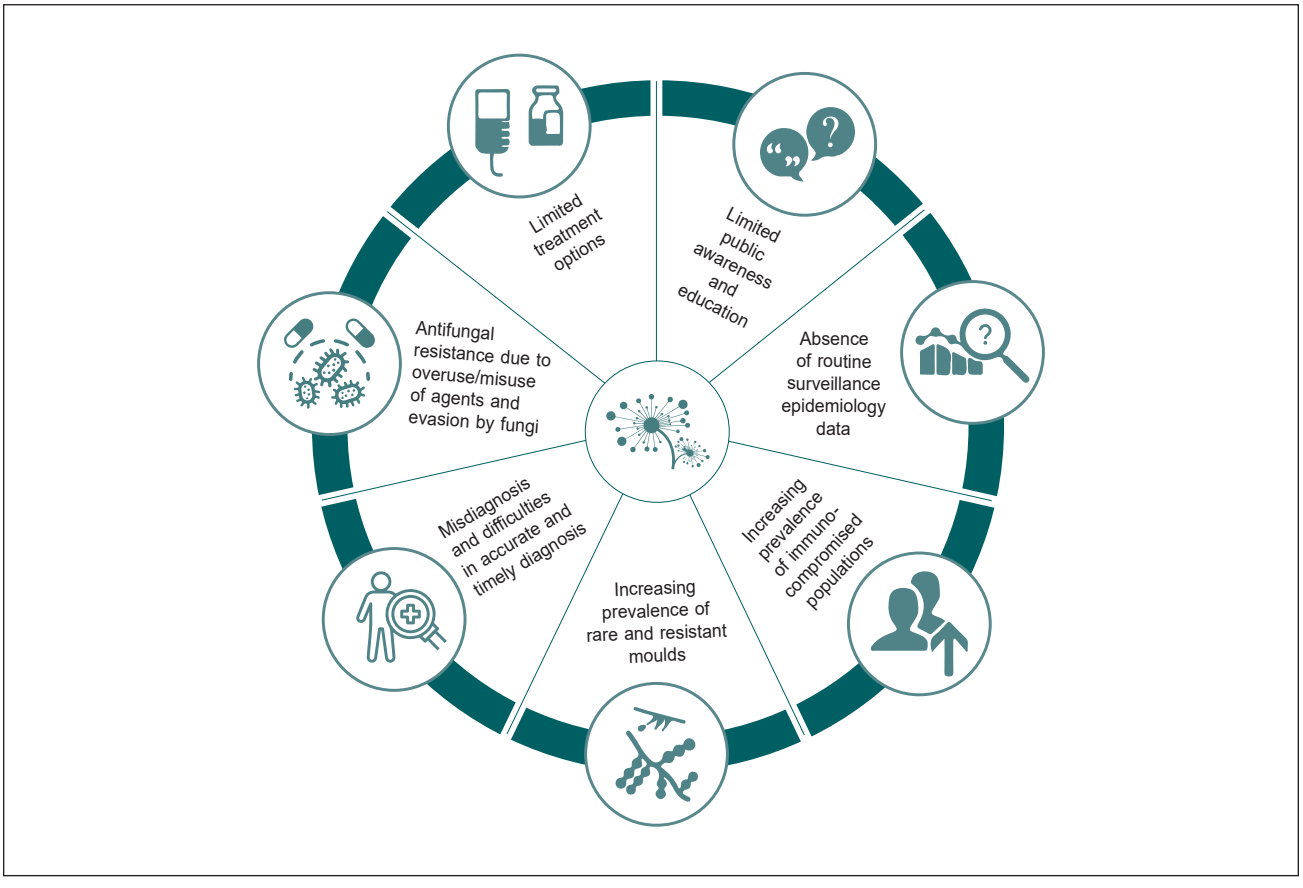

Figure 1. Challenges in the management of IFIs[3].

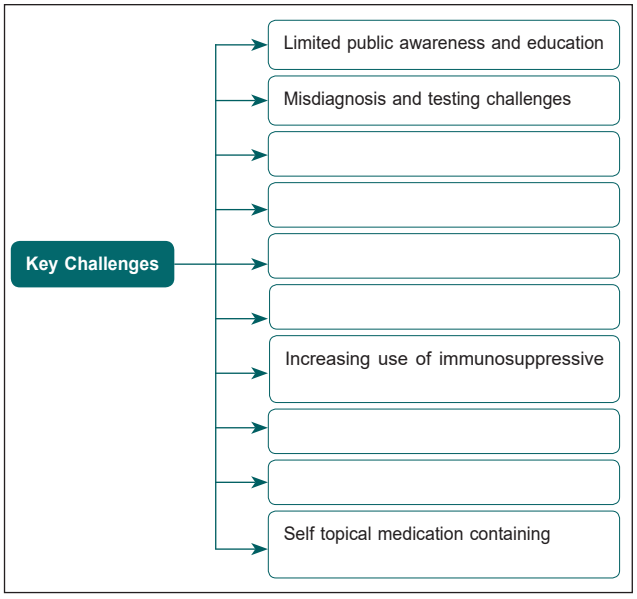

Figure 2. Key challenges in dealing with fungal infections[2].

- **Agent factors**
  - Common: *Trichophyton rubrum*, emerging: *Trichophyton interdigitale*, *Trichophyton mentagrophytes*
  - Virulence: Adhesins, keratin-digesting enzymes, cytokine induction
  - Immune evasion: Mannans suppress lymphocyte response.

Dermatologists in India are increasingly dealing with stubborn cases of dermatophytosis, primarily due to the overuse and improper application of topical steroid-antifungal combination creams. These formulations were originally intended to reduce inflammation and itching, but many patients have used them for extended periods without medical supervision. As a result, the infections have become more resistant and difficult to treat[14,15].

TREATMENT APPROACHES

Treatment strategies depend on infection type and severity. Topical antifungals are first-line for mild to moderate cases such as tinea corporis, tinea pedis, and tinea cruris. Oral antifungals are reserved for widespread, chronic, or treatment-resistant infections. Commonly used drug classes include azoles (e.g., clotrimazole, miconazole, oxiconazole) and allylamines (e.g., terbinafine, naftifine), with other options like ciclopirox and amorolfine useful for nail infections. Given the variability in fungal infections, treatment must be individualized, considering the pathogen involved, anatomical site, inflammation severity, patient's age, and underlying health conditions[16-18].

HIGHLIGHTS

Superficial fungal infections (tinea) affect 20%-25% of the global population.

- Caused by fungi that feed on keratin in the skin, hair, and nails.
- In India, prevalence varies by region and population. The most common types: tinea corporis and tinea cruris.
- Rising cases and drug resistance make management challenging.
- Awareness and early diagnosis are crucial for effective treatment.

SCOPE AND OBJECTIVE

This review aims to provide a comprehensive analysis of oxiconazole, an imidazole-class antifungal agent, with a focus on its pharmacological properties, antifungal spectrum, and clinical effectiveness in the management of superficial fungal infections. It brings together current evidence on its mechanism of action, therapeutic uses, safety profile, and comparative efficacy with other topical antifungals. The aim is to highlight the clinical benefits of topical antifungal therapy—particularly oxiconazole—and to guide its optimal use while identifying directions for future research.

OXICONAZOLE: A POTENTIAL TOPICAL ANTIFUNGAL IN THE ARMAMENTARIUM FOR DERMATOPHYTOSES

Oxiconazole nitrate, an imidazole derivative, exerts its antifungal effects mainly by inhibiting ergosterol biosynthesis, essential for maintaining cellular membrane integrity. It demonstrates broad *in vitro* activity against various pathogenic fungi. Oxiconazole is effective against most strains of specific organisms, both *in vitro* and clinical infections at the relevant body sites[15].

Oxiconazole penetrates the skin effectively upon topical application, as demonstrated by *in vitro* studies. Although it is well absorbed locally, systemic absorption is minimal, leading to low concentrations in the bloodstream[16,19].

This review provides an in-depth analysis of oxiconazole, focusing on its pharmacological profile, antifungal activity, and clinical use in treating superficial fungal infections.

Mechanism of Action and Effectiveness of Oxiconazole

Oxiconazole is a potent antifungal agent that targets the enzyme lanosterol 14α-demethylase (CYP51) in fungal cell membranes, causing toxic sterols to accumulate and

make the membrane more permeable, leading to fungal cell death. This enzyme is crucial for maintaining the integrity of the fungal cell membrane, which is destabilized without it. Oxiconazole also inhibits DNA synthesis and reduces ATP levels within the cell. Its broad-spectrum activity makes it a valuable treatment option for superficial fungal infections, especially those caused by dermatophytes and yeast. Clinical studies show that oxiconazole effectively clears symptoms and fungal infections within 2 to 4 weeks of treatment[19-23].

Spectrum of Antifungal Activity: Antifungal Activity of Oxiconazole

Oxiconazole is a broad-spectrum antifungal agent with activity against various pathogens (Table 1).

Oxiconazole, a cell-protective agent, inhibits ergosterol synthesis, a crucial component of the fungal cell membrane, leading to fungal cell death, and exhibits broad antifungal activity against various dermatophytes, both *in vitro* and *in vivo*[20,23].

Clinical Use and Effectiveness

Oxiconazole nitrate (1%) cream was introduced in the United States in 1989 for once-daily treatment of tinea pedis, tinea cruris, and tinea corporis. It is also effective for treating tinea versicolor. In clinical studies, oxiconazole has demonstrated an excellent clinical response, with a mycologic cure rate of around 80% within 2 weeks post-treatment for conditions like tinea pedis[20].

After applying oxiconazole cream, it is rapidly absorbed into the skin, reaching maximum concentrations within 100 minutes. Fungicidal concentrations are maintained in the skin for over 5 hours, and the drug's levels remain above the minimum inhibitory concentrations for more than 16 hours. This ensures sustained antifungal activity[20].

Indications for Use[19]

Dermatophytoses

Effective for treating tinea corporis (body ringworm), tinea cruris (jock itch), and tineapedis (athlete's foot), caused by fungi such as *T. rubrum, T. mentagrophytes*, or *E. floccosum*, and others.

Topical treatment is typically effective for uncomplicated cases. Oral antifungals may be needed for more extensive or chronic infections.

Table 1. Antifungal Activity of Oxiconazole

Pathogens	Activity against
Dermatophytes	*Trichophyton* spp., *Epidermophyton floccosum*, *Microsporum* spp.
Yeasts	*Candida albicans* and non-albicans *Candida* species
Molds	Moderate activity against some environmental molds

Pityriasis (Tinea) versicolor

Effective for treating infections caused by *Malassezia furfur*. Topical antifungals are usually sufficient, but oral antifungals may be required for severe or recurrent cases.

Cutaneous candidiasis

Treats infections caused by *C. albicans* or *Candida tropicalis.*

Efficacy and Tolerability[19,20]

- Oxiconazole cream has demonstrated similar or superior effectiveness compared to other antifungals such as miconazole, clotrimazole, and econazole.
- It is generally well-tolerated, with fewer reports of irritation than treatments like econazole.
- Oxiconazole is minimally absorbed into the bloodstream and has no detectable systemic effects.
- Once-daily application makes oxiconazole a useful option for patients who struggle with adherence to multiple-daily antifungal regimens.

Clinical Efficacy

Tinea pedis (Athlete's foot)

Overview of tinea pedis: Causes, risk factors, and complications (Table 2)[16,19,22,24,25].

Table 2. Tinea Pedis: Causes, Risk Factors, and Complications

Aspect	Details
Condition	Tinea pedis (Athlete's foot)
Cause	Dermatophytes: *T. rubrum*, *T. mentagrophytes*, *T. interdigitale*, *E. floccosum*
Mode of transmission	Direct contact with the fungus, especially in areas like locker rooms, showers, and swimming pools
Risk factors	• Diabetes • Wearing occlusive footwear
Complications if untreated	• Cellulitis • Pyoderma • Osteomyelitis (especially in immunocompromised or diabetic individuals, or those with peripheral vascular disease)

Topical imidazoles, including oxiconazole, are effective treatments for tinea pedis and are associated with a low incidence of adverse effects. Several clinical trials have revealed the effectiveness of 1% oxiconazole cream or lotion, applied once- or twice-daily for 2 to 4 weeks, in achieving high cure rates for athletes' foot and ringworm.

Tinea corporis

Tinea corporis: Key features, causative agents, and treatment (Table 3)[8,22,26,27].

A study by Islam et al (2014) demonstrated that once-daily topical application of 1% oxiconazole cream was highly effective in treating superficial fungal infections of the skin. The study included 81 patients diagnosed with tinea corporis and/or tinea cruris. Patients were instructed to apply the cream once-daily for 2 weeks, with clinical assessments conducted at weekly intervals throughout the treatment period[28].

Tinea versicolor

Tinea versicolor: From cause to cure (Table 4)[27,28].

Candidiasis

Candidiasis: Common sites, causes, and treatment (Table 5)[29,30].

In an open randomized study, 51 women with vaginal candidiasis were treated to compare the effectiveness and local tolerance of two antifungal regimens. Twenty-five patients received a single 600 mg dose of oxiconazole (one vaginal tablet), while 26 received a 3-day regimen of econazole (150 mg ovule once-daily). Follow-up evaluations were conducted at 1 week and again at 4 to 5 weeks after the initial visit, assessing yeast culture results, clinical symptoms, and any adverse effects[30].

Table 3. Tinea Corporis: Key Features, Causative Agents, and Treatment

Aspect	Details
Condition	Tinea corporis (Ringworm of the body)
Cause	Annular (ring-shaped) lesions on the skin
Mode of transmission	Dermatophytes
Risk factors	• *Trichophyton*: Affects skin, hair, and nails • *Microsporum*: Affects skin and hair • *Epidermophyton*: Affects skin and nails
Complications if untreated	Oxiconazole nitrate (Topical imidazole antifungal)

Both treatment groups achieved a 92% cure rate. Of the 4 treatment failures (2 in each group), only 1 patient from the econazole group failed to respond to a second course of the same treatment. The most common local side effect was vaginal burning, reported by 5 patients in the oxiconazole group and 6 in the econazole group[30].

Table 4. Tinea Versicolor: From Cause to Cure

Aspect	Details
Condition	Tinea versicolor
Cause	*Malassezia* species (especially *M. globosa*, *M. furfur*, *M. sympodialis*)
Appearance	Scaly, hypopigmented or hyperpigmented patches on upper trunk, neck, and upper arms
Diagnosis	Primarily clinical; confirmed by potassium hydroxide (KOH) test showing hyphae and spores
First-line treatment	Topical antifungals (preferred for safety, lower cost, and minimal drug interactions)
When to use oral therapy	For extensive, recurrent, or resistant cases
Common topical	Topical azoles including oxiconazole
Oxiconazole benefits	Significant improvement in scaling and pigmentation within 2 weeks of use

Table 5. Candidiasis: Common Sites, Causes, and Treatment

Aspect	Details
Organism	*Candida* species (yeast normally present on skin, mouth, gastrointestinal tract, and vagina)
When it becomes harmful	Overgrowth under favorable conditions
Common infection sites	Mouth, groin, armpits, between fingers/toes, under breasts, skinfolds
Deeper infection sites	Mouth, esophagus, and vagina
Topical treatment	Oxiconazole is effective for cutaneous candidiasis, especially in intertriginous areas
Clinical benefits of oxiconazole	Reduces both inflammation and fungal burden
Comparative study	Oxiconazole and econazole both showed a 92% cure rate for vaginal candidiasis
Side effects	Mild, including occasional vaginal burning

HIGHLIGHTS

- Oxiconazole nitrate is a potent antifungal that targets lanosterol 14α-demethylase (CYP51), disrupting fungal cell membranes.
- Leads to toxic sterol accumulation, increased membrane permeability, and fungal cell death.
- Also inhibits DNA synthesis and reduces ATP levels in fungal cells.
- Has broad-spectrum activity, effective against dermatophytes and yeast.
- Clinical studies show symptom clearance within 2 to 4 weeks of treatment.
- Introduced in the US in 1989; shows ~80% mycologic cure within 2 weeks for tinea pedis.
- Available as 1% cream or lotion; effective for athlete's foot and ringworm.
- Well-tolerated,with minimal systemic absorption and no detectable systemic effects.

RESISTANCE AND LIMITATIONS

While traditionally used as a topical antifungal agent, oxiconazole has recently shown promising antibacterial properties, suggesting potential beyond its original indications.

A study by Kaul et al (2023) screened compounds from the Prestwick chemical library and identified oxiconazole as a nonantibiotic agent with unexpected antibacterial activity.

Notably, oxiconazole demonstrated effectiveness against Gram-positive pathogens such as *Staphylococcus aureus* and *Enterococcus* species, including strains often associated with drug resistance.

This has made it a potential candidate for repurposing to help manage antimicrobial resistance, which is a growing global concern. Its ability to act against resistant bacteria could help fill treatment gaps where current antibiotics are no longer effective[31].

Although resistance to oxiconazole is still uncommon, it may not work as well in people with chronic infections or weakened immune systems. Like other antimicrobial drugs, careful use—such as correct dosing, proper treatment duration, and regular monitoring—is important to maintain its effectiveness.

These findings highlight the need for more research to understand oxiconazole's full antibacterial potential and its possible role in treating resistant infections.

HIGHLIGHTS

- Oxiconazole, a topical antifungal, has shown unexpected antibacterial activity.
- Kaul et al (2023) identified its effectiveness against Gram-positive bacteria like *S. aureus* and *Enterococcus* species.
- Holds promise as a nonantibiotic option to combat antimicrobial resistance.
- Resistance to oxiconazole is rare, but efficacy may be reduced in chronic infections or immunocompromised patients.
- Further research is needed to confirm and expand its antibacterial potential.

SAFETY AND TOLERABILITY

Oxiconazole is a well-tolerated, broad-spectrum therapy that is safe for pediatric use and has comparable efficacy and safety as other topical antifungal imidazoles. It is a safe and effective alternative in treating tinea infections caused by dermatophytic fungi[32,33].

A study by Kalis et al (1996) found that oxiconazole cream was more effective and well-tolerated than ketoconazole cream for treating tinea cruris. The study involved 79 patients, with oxiconazole being more effective and faster in curing mycosis. On Day 14, 77.1 p. 100 patients treated with oxiconazole had been cured, compared to 51.7 p. 100 with ketoconazole. On Day 21, oxiconazole group showed 97.2 p. 100 effectiveness compared to 86.7 p. 100 in the ketoconazole group. No correlation was found between cured patients' ratio and mycosis duration. The safety of the treatment was also assessed, and no adverse effects were reported. The study concluded that oxiconazole cream is more effective and well-tolerated than ketoconazole cream for treating tinea cruris after 3 weeks of topical treatment[34].

Oxiconazole nitrate 1% cream was introduced in the United States in 1989 for once-daily treatment of tinea cruris, tinea pedis, and tinea corporis. It has also been effective in managing tinea (pityriasis) versicolor. *In vitro* studies have shown that oxiconazole has potent activity against many dermatophytes, including *T. rubrum*, *T. mentagrophytes*, *T. tonsurans*, and *E. floccosum*. After topical application, it is rapidly absorbed into the stratum corneum and maintains fungicidal concentrations in the epidermis and deeper skin layers for at least 5 hours[20].

Additionally, several clinical trials comparing oxiconazole with other topical antifungal agents have shown that it offers similar or greater efficacy than miconazole,

clotrimazole, and tolnaftate, and performs on par with econazole and bifonazole. Its safety profile is comparable to these agents, and because systemic absorption is negligible, oxiconazole does not produce detectable systemic effects[20].

A study by Jerajani et al (2000) evaluated the efficacy and safety of once daily topical administration of 1% oxiconazole cream and lotion in treating tinea cruris, tinea corporis, and tinea pedis patients (Table 6). The results showed a progressive fall in severity scores of erythema, pruritus, scaling, vesicles, papules, and burning over 4 weeks[35].

In another double-blind, randomized multicenter study conducted by Wagner et al (1987), the efficacy and tolerability of oxiconazole (n = 105) and bifonazole (n = 99) were compared in 204 patients with dermatomycosis and erythrasma. Both groups received treatment for an average of 25 days. Clinical healing and mycological clearance were achieved in 86% and 81% of patients. Tolerability was rated as excellent in 70% of the oxiconazole group and 71% of the bifonazole group. Local side effects were minimal, occurring in 1% of oxiconazole-treated patients and 4% of those receiving bifonazole. The study concluded that both agents were equally effective and well-tolerated[36].

Table 6. Clinical Evaluation of 1% Oxiconazole Cream and Lotion in Dermatophytoses

Parameter	Oxiconazole lotion	Oxiconazole cream
Study design	Open-label, non-comparative	Open-label, non-comparative
Conditions treated	Tinea cruris, tinea corporis, tinea pedis	Tinea cruris, tinea corporis, tinea pedis
Symptom improvement (Week 1)	35%	35%
Symptom improvement (Week 4)	87.6%-98.7%	82.5%-99.5%
Global evaluation (Clear)	60%	10%
Global evaluation (Excellent)	21%	71%
Global evaluation (Good)	17%	16%
Tinea pedis response (Clear)	4/8	8/15
Tinea pedis response (Excellent)	2/8	4/15
Tinea pedis response (Good)	1/8	1/15
Side effects	None reported among 178 patients	None reported among 178 patients

HIGHLIGHTS

- Oxiconazole is a safe and effective imidazole antifungal for treating tinea infections caused by dermatophytes.
- Found to be more effective and better tolerated than ketoconazole for tinea cruris.
- Introduced in the US in 1989; shows potent activity against a wide range of dermatophytes.
- Clinical trials show equal or superior efficacy compared to miconazole, clotrimazole, and tolnaftate, and comparable to econazole and bifonazole.
- Jerajani et al (2000): Reported progressive reduction in symptoms (erythema, pruritus, scaling, etc.) over 4 weeks.
- Wagner et al (1987): Double-blind study showed similar efficacy and tolerability to comparator agents.

COMPARISON WITH OTHER ANTIFUNGALS

Oxiconazole is a topical antifungal agent with broad-spectrum activity, convenient dosing, and favorable tolerability. It targets a wide range of fungi, including dermatophytes, yeasts like *Candida* species, and *Malassezia*, making it suitable for treating superficial fungal infections like tinea corporis, tine acruris, tinea pedis, and cutaneous candidiasis. Its once-daily application may improve patient compliance compared to multiple-daily regimens required for other imidazoles[31-34].

Additionally, oxiconazole has demonstrated comparable or even superior clinical efficacy in treating dermatophytic infections while maintaining a low risk of adverse effects. It is generally well-tolerated, with only mild local reactions such as itching or burning reported in a small number of patients. Compared to terbinafine, which is highly effective against dermatophytes but less so against yeasts, oxiconazole offers a broader antifungal spectrum.

Furthermore, while ciclopirox is sometimes used for resistant infections, oxiconazole remains a preferred

choice for uncomplicated tinea and candidal infections due to its balance of efficacy, convenience, and patient comfort. This makes oxiconazole a strong first-line option among topical antifungal therapies[32,34].

Table 7. Oxiconazole's Edge Over Other Antifungals

	Mechanism	Absorption/ Pharmacokinetics	Clinical indication	Antifungal effects	Dosage form
Oxiconazole	Inhibition of fungal lanosterol 14α-demethylase resulting in depletion of ergosterol and accumulation of toxic sterols in the fungal cell membrane[16].	Topical oxiconazole is rapidly absorbed into the stratum corneum. Systemic absorption of oxiconazole is negligible[16].	Active against *T. rubrum, T. mentagrophytes, T. tonsurans, T. violaceum, E. floccosum, Microsporum canis, M. audouini, M. gypseum, C. albicans,* and *M. furfur*[16].	Fungistatic[16]	Cream (1%) and lotion (1%)[16]
Ketoconazole	Inhibition of fungal lanosterol 14α-demethylase resulting in depletion of ergosterol and accumulation of toxic sterols in the fungal cell membrane[16].	Topical absorption of ketoconazole is minimal; no plasma levels are detected following cream or shampoo application. Hair keratin penetration is approximately 5% after a single shampoo. Gastrointestinal absorption is well-established when taken orally. Elimination follows a biphasic pattern: • Initial half-life: 2 hours during the first 10 hours post-dose • Terminal half-life: 8 hours thereafter[35].	Inhibits the growth of dermatophytes and yeasts including *T. rubrum, T. mentagrophytes, T. tonsurans, M. canis, M. audouini, M. gypseum, E. floccosum, C. albicans, C. tropicalis, M. ovale,* and *M. furfur*[16].	Fungistatic[16]	Cream, shampoo, and tablet[16]
Terbinafine	Interferes with synthesis of ergosterol by inhibiting squalene 2,3-epoxidase that is responsible to convert squalene to squalene oxide[16].	Systemic absorption of terbinafine is clinically insignificant. Only 3%-5% of the applied dosage is absorbed systemically following topical application of 1% terbinafine cream. Bioavaibility 70%-90% Protein binding >99% Metabolism liver Half-life 36 hours[36].	Terbinafine has demonstrated excellent *in vitro* fungicidal activity against various dermatophytes, including *T. mentagrophytes, T. rubrum, T. tonsurans, and E. floccosum.* It also exhibits potent activity against *Candida* spp., including *C. albicans* and *C. parapsilosis*, nondermatophytemolds such as *Scopulariopsis* spp., and *Aspergillus* spp. for the treatment of onychomycosis of the toenail or fingernail due to dermatophytes[16].	Candida: fungistatic[16]	Topical application: 1% cream and Terbinafine tablets[16]

Table 7. Oxiconazole's Edge Over Other Antifungals

	Mechanism	Absorption/ Pharmacokinetics	Clinical indication	Antifungal effects	Dosage form
Ciclopirox	Inhibition of essential enzymes by creating a large polyvalent cation through chelation, thus interfering with mitochondrial electron transport processes and energy production[16].	Systemic absorption is minimal, with only 1.3% of the dose absorbed after topical application of 1% ciclopirox cream to the back with occlusion for 6 hours[16].	Ciclopirox has broad-spectrum fungistatic or fungicidal activity *in vitro* against dermatophytes (*Trichophyton* spp., *Microsporum* spp., *E. floccosum*), yeasts (*Candida* spp., *Malassezia* spp., *C. neoformans*), dimorphic fungi (*Blastomyces dermatitidis*, *Histoplasma capsulatum*), eumycetes, actinomycetes, and various other fungi including *Aspergillus* spp., *Penicillium* spp., *Phialophora* spp., and *Fusarium* spp.[16]	Fungicidal and fungistatic[16]	Ciclopirox is available in multiple formulations, including a cream (1%), lotion (1%), gel (0.77% in a free acid form), topical suspension, and nail lacquer (8%)[16].

CONCLUSION

In summary, oxiconazole stands out as a safe, potent, and convenient first-line treatment for a wide range of superficial fungal infections.

Oxiconazole is superior over other antifungal agents because of the below advantages:

- **Broad-spectrum activity:** Effective against a wide range of pathogens including dermatophytes, yeasts (*Candida* spp.), and some molds.
- **Once-daily dosing:** Convenient application improves patient compliance compared to antifungals that require multiple daily applications.
- **Rapid symptom relief**: Clinical studies show significant symptom improvement (scaling, pruritus, and erythema) within the first week of use.
- **High cure rates:** Demonstrates equal or superior cure rates compared to other topical antifungals like clotrimazole, miconazole, and econazole.
- **Excellent skin penetration**: Penetrates deeply into skin layers, enhancing efficacy without increasing systemic exposure.
- **Minimal systemic absorption**: Low risk of systemic side effects, making it safer for long-term or widespread use.
- **Well-tolerated:** Fewer reports of local irritation compared to some other topical antifungals (e.g., econazole).
- **Effective in resistant or recurrent cases**: Proven efficacy in recurrent or treatment-resistant superficial fungal infections.

Oxiconazole nitrate (1%) cream is well-tolerated and effective for tinea pedis, tinea cruris, and tinea corporis. It remains in the epidermis at therapeutic levels for up to 7 days, enabling effective fungal clearance with once-daily dosing.

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Disclosure of Interest

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