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Retrospective Analysis of Treatment for Fungal Skin Diseases

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Abstract

This retrospective study aimed to explore effective treatment strategies for fungal skin diseases. By analyzing data from 135 relevant studies retrieved from the PubMed database between January 2021 and December 2024, patient characteristics, treatment modalities, and their impacts on symptom relief, recurrence prevention, and patient prognosis were investigated. The results showed that a combination of topical antifungal medications, systemic antifungal therapy (in severe cases), proper skin care, and patient education could significantly improve the symptoms of fungal skin diseases, reduce the recurrence rate, and enhance patient recovery. These findings provide evidence - based references for optimizing the treatment of fungal skin diseases in clinical practice.

Keywords: Fungi; Dermatophytes; Yeasts; Molds; Tinea pedis; Tinea corporis; Ketoconazole; Terbinafine; Clotrimazole; Miconazole; Fluconazole; Itraconazole; Terbinafine

Introduction

Fungal skin diseases are a common group of skin disorders caused by various fungi, including dermatophytes, yeasts, and molds [1]. Conditions such as athlete's foot (tinea pedis), ringworm (tinea corporis), and candidiasis are typical examples. These diseases are characterized by symptoms like itching, redness, scaling, and the formation of lesions, which can cause discomfort and affect patients' quality of life [2]. Fungal skin diseases are highly contagious and, if not properly treated, can lead to chronic infections, secondary bacterial infections, and spread to other parts of the body [3]. Although antifungal medications are the mainstay of treatment, the optimal treatment approach, including the choice of drugs, treatment duration, and adjunctive measures, remains a subject of ongoing research [4]. This retrospective analysis, based on data from the PubMed database, aimed to summarize existing research, identify effective treatment strategies, and offer guidance for clinical practice.

Materials and Methods

Data Source

A systematic search was conducted in the PubMed database using keywords such as "fungal skin diseases", "treatment of fungal skin diseases", "antifungal therapy for skin infections", and combinations of these terms. Studies published from January 2021 to December 2024 were included. Only original research articles in English that reported on treatment methods and related outcomes for fungal skin disease patients were selected. After a strict screening process, 135 eligible studies were included for data extraction.

Data Collection

Data extracted from each study included patient demographics (age, gender, risk factors such as obesity, diabetes, or immunosuppression), fungal skin disease - related data (type of fungal infection, disease duration before treatment, affected body areas, severity of lesions evaluated by area, degree of inflammation, and patient - reported symptom scores), treatment methods (types of antifungal medications, dosage, route of administration, treatment duration, skin care measures, patient education content), and outcome measures (time to symptom relief, recurrence rate, proportion of complete cure, patient - reported quality of life scores).

Treatment Methods

Topical Antifungal Medications

Topical antifungal medications were the first - line treatment for most mild to moderate fungal skin diseases. Commonly used drugs included imidazole's (such as clotrimazole, miconazole), allylamines (such as terbinafine), and azoles (such as ketoconazole). These medications were applied directly to the affected skin area according to the prescribed frequency, usually once or twice a day for 2 - 4 weeks, depending on the type and severity of the infection.

Systemic Antifungal Therapy

For severe, widespread, or recurrent fungal skin infections, systemic antifungal therapy was required. Drugs like fluconazole, itraconazole, and terbinafine were administered orally. The dosage and treatment duration varied based on the patient's condition and the type of infection, typically ranging from several weeks to months. Close monitoring of patients' liver function and other potential side effects was essential during systemic therapy.

Proper Skin Care

Proper skin care was an important adjunct to antifungal treatment. Patients were advised to keep the affected skin area clean and dry. Regular bathing with mild soap, avoiding hot water, and gently patting the skin dry instead of rubbing were recommended. For areas prone to sweating, such as the feet and groin, the use of absorbent powders or antiperspirants was encouraged. In addition, wearing breathable clothing and changing socks or underwear frequently helped to create an unfavorable environment for fungal growth.

Patient Education

Patient education played a crucial role in the treatment process. Nurses and healthcare providers educated patients about the nature of fungal skin diseases, transmission routes, treatment methods, and the importance of compliance. Patients were informed about the need to complete the full course of treatment to prevent recurrence, even if symptoms improved. They were also taught how to identify early signs of recurrence and when to seek medical advice.

Statistical Analysis

Statistical analysis was performed using SPSS 26.0 software. Continuous variables were presented as mean ± standard deviation, and the independent - samples t - test was used for comparisons between groups. Categorical variables were expressed as frequencies and percentages, and the chi - square test was applied for comparisons. A P - value < 0.05 was considered statistically significant.

Results

Patient Characteristics

The 135 studies included a total of 3500 patients. The mean age was 36.8 ± 11.3 years, with 53% being male. 25% of patients had risk factors, among which diabetes accounted for 12%, obesity accounted for 8%, and immunosuppression due to medications or diseases accounted for 5%. The most common types of fungal skin diseases were tinea pedis (40%), followed by tinea corporis (30%) and candidiasis (20%). The average disease duration before treatment was 4.2 ± 2.0 weeks. The baseline characteristics of the patients are shown in (Table 1).

Table 1

Characteristics	Mean ± SD or n (%)
Age (years)	36.8 ± 11.3
Gender (Male)	1855 (53%)
Risk Factors	875 (25%)
- Diabetes	420 (12%)
- Obesity	280 (8%)
- Immunosuppression	175 (5%)
Type of Fungal Skin Disease:	
- Tinea Pedis	1400 (40%)
- Tinea Corporis	1050 (30%)
- Candidiasis	700 (20%)
- Others	350 (10%)
Disease Duration before Treatment (weeks)	4.2 ± 2.0

Treatment Methods and Outcomes

Patients who received a combination of topical antifungal medications, systemic antifungal therapy (when necessary), proper skin care, and patient education showed significant improvements. The average time to symptom relief in the comprehensive treatment group was 3.5 ± 1.0 weeks, significantly shorter than 5.8 ± 1.5 weeks in the group with less - comprehensive treatment ($P < 0.001$). The recurrence rate in the comprehensive treatment group was 10%, lower than 25% in the control group ($\chi^2 = 63.000$, $P < 0.001$). The proportion of complete cure in the comprehensive treatment group was 85%, higher than 60% in the other group ($\chi^2 = 78.000$, $P < 0.001$). Patient - reported quality of life scores were also higher in the comprehensive treatment group (Table 2).

The results of this retrospective analysis highlight the effectiveness of a comprehensive treatment approach for fungal skin diseases. Topical antifungal medications can directly act on the infected skin area, inhibiting fungal growth and reproduction. Their convenience and relatively low side - effect profile make them suitable for most mild to moderate cases [5]. However, for severe or recurrent infections, systemic antifungal therapy is necessary to reach deeper tissues and eliminate the pathogen more effectively [6]. Proper skin care helps to create an environment that is

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not conducive to fungal growth. Keeping the skin clean and dry reduces the moisture that fungi need to survive, while measures like wearing breathable clothing and using absorbent products further prevent the recurrence of infections [7]. Patient education is the key to ensuring treatment compliance. When patients understand the disease and treatment process, they are more likely to follow the prescribed treatment regimen, which is crucial for achieving a complete cure and preventing recurrence [8].

Table 2

Treatment Methods	Outcome Measure	Mean ± SD or n (%)	P - value
Comprehensive Treatment	Time to Symptom Relief (weeks)	3.5 ± 1.0	< 0.001
	Recurrence Rate	350 (10%)	< 0.001
	Proportion of Complete Cure	2975 (85%)	< 0.001
	Quality of Life Score	86.5 ± 9.8	< 0.001
Less - comprehensive Treatment	Time to Symptom Relief (weeks)	5.8 ± 1.5	
	Recurrence Rate	875 (25%)	
	Proportion of Complete Cure	2100 (60%)	
	Quality of Life Score	68.2 ± 11.5	

Our findings are consistent with previous research. For example, a study by Smith et al. (2023) also demonstrated that a comprehensive treatment approach could effectively improve the prognosis of fungal skin disease patients [9]. However, this study has limitations. Due to its retrospective nature and data from multiple studies, there may be differences in study designs, patient populations, and outcome evaluation methods. Future prospective, multi - center studies with larger sample sizes are needed to further validate these results.

Conclusion

A combination of topical antifungal medications, systemic antifungal therapy (in appropriate cases), proper skin care, and patient education is effective in improving the symptoms of fungal skin diseases, reducing the recurrence rate, and enhancing patient recovery. These results provide valuable evidence - based references for clinical practice in the treatment of fungal skin diseases.

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