Editorial

The Growing Threat of Fungal Resistance in Dermatology: A Call to Action

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The rise of fungal resistance in dermatology poses a significant threat to public health, compromising our ability to effectively treat common skin infections.[1] As dermatologists, researchers, and policymakers, it is imperative that we acknowledge the severity of this issue and take collective action to mitigate its consequences.

Fungal infections, such as dermatophytosis, candidiasis, and onychomycosis, affect millions of people worldwide. Traditionally, these infections have been treated with topical or systemic antifungal agents, such as azoles, allylamines, and polyenes. However, the overuse and misuse of these medications have accelerated the development of fungal resistance, rendering them less effective.

The consequences of fungal resistance are far-reaching. Patients may experience prolonged, recurrent, and severe infections, increased morbidity, transmission of infection, and reduced quality of life. Moreover, the economic burden of fungal resistance is substantial, with estimated annual costs exceeding billions of dollars.

Factors Influencing Antifungal Choice: There are many factors that need to be considered while prescribing an antifungal like fungal species and susceptibility, Infection site and severity, patient age, weight, renal and hepatic function, potential drug interactions, or any allergic reactions or hypersensitivity to the drugs. In addition to these the socioeconomic status of the patient and any favoritism with a specific pharmaceutical company also affect the choice.

Several Factors Contribute to the Emergence of Fungal Resistance. These Include:

1. Incomplete treatment, duration or dosage, due to lack of awareness, and inadequate guidelines by the physician.
2. Insufficient antifungal spectrum or potency.
3. Resistance to antifungal agents.
4. Immunocompromised host (e.g., HIV/AIDS, cancer, immunosuppressive therapy).
5. Presence of biofilms or fungal burdens.[3]
7. Underlying medical conditions (e.g., diabetes, vascular insufficiency).
8. Poor patient compliance or adherence.
9. Overprescription and misuse of antifungal agents: The liberal use of antifungals, particularly in mild cases, especialy without a proper diagnostic testing, accelerates the selection of resistant strains.[2]
10. Lack of novel antifungal agents: The development of new antifungal medications has slowed, latest drug being more than ten years ago now, leaving us with limited treatment options.
11. Inadequate diagnostic tools: The reliance on clinical diagnosis and inadequate laboratory testing can lead to misdiagnosis and inappropriate treatment.
12. Climate change and globalization: The increasing global temperature and interconnectedness facilitate the spread of fungal pathogens and resistant strains.
13. Combination of topical antifungals with steroids.[4]
14. Poor socio-economic conditions: lack of funds, high cost of oral antifungals, poverty. Poor hygiene, overcrowding add to the problem.
15. Low quality antifungal brands, containing less than standard quantity

To combat fungal resistance, we must adopt a multifaceted approach:

1. Stewardship of antifungal agents: Promote

responsible prescribing practices, and develop guidelines for the judicious use of antifungals especially among general practitioners.

2. Development of novel antifungal agents: Encourage research and investment in the development of new antifungal medications and alternative therapies.
3. Improved diagnostic tools: Develop and implement rapid, accurate, and accessible diagnostic tests to facilitate timely and targeted treatment. Where available, antifungals should not be prescribed without confirmation of diagnosis. A simple scraping followed by KOH mount is very helpful. Both at the beginning of treatment and at the end of clinical cure.
4. Public awareness and education: Educate patients, healthcare professionals, and the general public about the risks of fungal resistance and the importance of responsible antifungal use.
5. Global collaboration and surveillance: Establish international networks to monitor and track fungal resistance, sharing data and best practices to inform policy and treatment decisions.
6. Prescribing an antifungal brand which is well reputed, cost effective and has good efficacy as indicated by clinical response and peer reviews.
7. A big No-No to steroid combinations with topical antifungals.
8. Combination therapy (e.g., topical and systemic antifungals).
9. Prolonged treatment courses.
10. Consultation with infectious disease specialists
11. Proper guidelines to the patient at the time of prescription as to how long should it be continued, self-care, control comorbidities, especially diabetes, how to prevent transmission, how to apply the topical antifungals.

The "**Rule of 2**" for topical antifungal treatment[5]:

Duration

1. Treat for **2** weeks after clinical resolution of symptoms (e.g., clearance of lesions).
2. Minimum treatment duration: **2** months for dermatophyte infections (e.g., ringworm).

Frequency

1. Apply topical antifungal cream/ointment **2** times a day (BID).
2. Some treatments may require once-daily application, depending on the product and severity.

Additional Considerations

1. Ensure adequate coverage: Apply a thin layer to affected area and **2** cm beyond.
2. Use for **2** consecutive weeks after symptoms resolve to prevent relapse.

The time to act is now. We must acknowledge the gravity of fungal resistance and work collectively to address this growing threat. By adopting a comprehensive and coordinated approach, we can mitigate the impact of fungal resistance, protect public health, and ensure the continued effectiveness of antifungal therapies.

The future of dermatology depends on it

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