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Modern Methods of Treating Dermatomycoses, A Fungal Disease

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Introduction.

Current treatments for dermatomycoses include improvements in medication administration, diagnostic technologies, and personalised medicine strategies with well-established antifungal medicines. Below is a summary of several contemporary therapy facets:

1. Advanced Agents for Antifungals:

New azoles: New azole compounds with enhanced effectiveness, less adverse effects, and maybe wider antifungal spectra are still being developed by research. Investigating new azole class mechanisms of action is part of this.

Although echinocandins are mainly used to treat systemic fungal infections, several of them are also being researched for topical use in stubborn dermatomycoses, particularly those brought on by *Candida* species.

Allylamines: Terbinafine is still a staple, although studies are looking into ways to optimise its formulation and delivery for more effectiveness and fewer adverse effects.

Combination therapies: To treat severe infections or resistant fungus, it may be helpful to use two or more antifungal medications with distinct modes of action. The goal of this synergistic method is to get over the drawbacks of monotherapy.

2. Better Methods of Drug Delivery:

Topical formulations In order to increase efficacy, new formulations seek to promote medication penetration into the skin and nails. This covers nanoparticles, microemulsions, and liposomal preparations. These can reduce systemic exposure and adverse effects while increasing medication concentration at the infection site.

Targeted drug delivery: Studies look at ways to administer antifungal medications only to fungal cells while causing the least amount of harm to nearby healthy tissues.

Research and methods.

3. Advanced Diagnostic Techniques:

Molecular diagnostics: PCR (polymerase chain reaction) and other techniques are used to quickly and accurately identify the fungus that is causing the problem. This helps guide treatment decisions and may lessen the need for time-consuming culture methods. This makes it possible to treat patients early and more accurately.

Imaging methods: To aid in diagnosis and track the effectiveness of treatment, advanced imaging techniques including optical coherence tomography and confocal microscopy can help visualise fungal formations within the skin and nails.

4. Methods of Personalised Medicine:

Fungi genotyping: Customised therapy can be made possible by predicting treatment response and identifying resistance mechanisms by an analysis of the fungus's genetic composition.

Pharmacogenomics: Examining how a person's genetic composition affects how they react to antifungal medications can assist maximise therapeutic options and reduce side effects.

5. Adjunctive therapies, including phototherapy:

When treating psoriasis-like lesions linked to dermatomycoses, narrowband UVB phototherapy is occasionally utilised in addition to antifungal drugs. However, it is not a treatment in and of itself.

Laser therapy: Fungal cells can be targeted by certain laser wavelengths, however its potential for clinical use in dermatomycoses is still being studied.

6. Pay Attention to Onychomycosis and Nail Infections:

Surgical debridement: By removing badly damaged nail tissue, topical or oral antifungals can more effectively penetrate the nail.

Laser ablation: By destroying the contaminated nail tissue, laser therapy makes it simpler for antifungal drugs to enter the body.

Results.

Problems and Prospects for the Future:

Resistance to drugs: Drug-resistant fungi are still a significant problem. The main goals of research are to comprehend resistance mechanisms and create novel antifungals.

Prolonged treatment: A lot of dermatomycoses need ongoing care, which makes patients less likely to comply. One of the main objectives of research is shorter treatment regimes.

Side effects: There may be serious adverse effects from some antifungal drugs. Creating medications that are safer and more tolerable is a constant priority.

Numerous factors influence the medical efficacy of treating dermatomycoses, making it challenging to provide a single, broadly applicable success rate. Nonetheless, we can talk about the general results and the elements affecting effectiveness:

Factors Affecting Treatment Success: Fungal Type: The susceptibility of various antifungal drugs varies among fungi. For the best treatment selection, the species must be accurately identified.

Where and how bad the infection is: While deeper or more widespread infections (such onychomycosis or tinea capitis) may need oral antifungals and may have lower cure rates, superficial infections (like tinea corporis) typically respond well to topical therapies.

Patient adherence: It is crucial to follow the recommended course of treatment (dosage and duration) consistently. The likelihood of recurrence and the emergence of medication resistance are greatly increased by incomplete treatment.

Immune status: It may be more difficult for patients with compromised immune systems to get rid of the illness.

Comorbidities: The efficacy of treatment and the possibility of adverse consequences can be impacted by additional medical problems.

Drug interactions: The effectiveness and safety of antifungal medications may be impacted by interactions with other medications the patient is taking.

Treatment selection: The efficacy of the antifungal medication depends on its formulation (oral vs. topical).

Discussion.

Overall Results and Achievement Rates:

When applied properly, topical antifungal therapies for superficial dermatomycoses (tinea corporis, tinea cruris, and tinea pedis) frequently result in high cure rates (70–90%). However, if cleanliness habits aren't addressed, relapses are likely to occur.

Tinea capitis, often known as scalp ringworm, requires oral antifungals and has a cure rate of 70–90%, however relapses can happen and therapy takes longer.

Nail fungus, or onychomycosis, is infamously hard to cure. Depending on the antifungal administered, the location of the illness, and its severity, cure rates with oral antifungals range from 30 to 80%. Relapse is also frequent.

Obstacles and Restrictions:

Drug resistance: Because antifungal resistance is becoming more common, it is important to carefully identify species and consider using combination therapy or more recent antifungal drugs.

Treatment duration: A lot of antifungal medications have lengthy course requirements, which can make patients less compliant and possibly raise their risk of relapsing.

Significant side effects are a possibility with oral antifungal drugs, which might hinder treatment compliance and provide difficulties for some patient groups (e.g., those with liver or kidney disease).

Diagnosis: A correct diagnosis of the fungus causing the problem is essential for a successful course of treatment; nevertheless, a misdiagnosis may result in ineffective treatment.

Increasing the Efficiency of Treatment:

Accurate diagnosis: Choosing the best antifungal medication requires a precise identification of the fungus.

Patient education: It is essential to provide patients with comprehensive instruction on the significance of following the recommended treatment plan.

Better medication delivery methods: Novel formulations that increase drug bioavailability and penetration can lead to better treatment results.

Combination therapy: To combat resistance and increase efficacy, several antifungal drugs with distinct modes of action are used.

Monitoring and follow-up: Early detection and management of treatment failures or relapses depend on routine monitoring of treatment progress and follow-up sessions.

Conclusion.

Dermatomycoses are fungal infections affecting the skin, hair, and nails. Advances in antifungal therapy have introduced effective systemic and topical treatments, significantly improving patient outcomes. Below are the modern approaches to treating dermatomycoses.

In summary, modern approaches to treating dermatomycoses are moving beyond traditional antifungal therapies toward more precise, effective, and patient-centered treatments. Advancements in diagnostics, drug delivery, and personalized medicine are improving treatment outcomes and addressing the challenges associated with fungal resistance and long treatment durations. However, research continues to be crucial in developing even better and safer treatments for these common and sometimes recalcitrant infections. Always consult a healthcare professional for diagnosis and treatment.

Ultimately, while many dermatomycoses are treatable, success is not guaranteed. The effectiveness depends on several interwoven factors, highlighting the need for accurate diagnosis, appropriate treatment selection, patient compliance, and ongoing monitoring. A significant challenge remains the development of new antifungal agents to address the growing problem of drug resistance.

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