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Breaking the fungal biofilm with Q-switched Nd: YAG laser and black peel: species-blind nonpharmacological eradication of Azole-resistant onychomycosis

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Background: Onychomycosis (ONM), hitherto an easily manageable problem, more commonly seen in elderly patients has unfortunately transformed into an extremely-difficult-to-treat nail disorder, especially due to the widespread azole resistance. Not only has the azole resistance become a reason of treatment failure with itraconazole or ITRA (the usual drug of choice), the azole-induced cross resistance to oral terbinafine and topical amorolofine has rendered ONM caused by dermatophytes, yeasts as well as molds to Multi-Drug-Resistant (MDR) ONM, refractory to all forms of pharmacological interventions. The problem is reaching epidemic proportions in South Asian Countries. The use of ITRA further becomes impossible in the elderly who are not only on polypharmacy (owing to plethora of drug interactions of ITRA), but also stemming from its absolute contraindication in patients with any disease that has impaired or has the potential to compromise the patient's cardiac function. However, ONM involving multiple nails in geriatric and diabetic patients warrants complete treatment as it serves as a source of recurrent tinea of the feet and other sites, and even contributes to formation of diabetic foot ulcers. Dermatologists across the Asia-Pacific are finding it difficult to treat all forms of ONM, especially because most have been rendered azole-resistant due to unscrupulous use of ITRA with respect to wrong dosage, duration and dietary-intake instructions due to wrong prescription by non-specialists and/or self-use by the patients.

Focus: Physical therapies, especially Q switched Nd: YAG and fractional lasers have been anecdotally reported to provide gratifying results in ONM. However, their success in eradication of proven MDR onychomycosis is lacking. In my lecture, I shall be discussing the mechanism of action, methodology, success rates, and mild precautions required


while treating MDR ONM with lasers, especially Q-switched Nd: YAG laser. I would crystallize the concepts on exploiting the latter's property of selective photo-thermolysis against the fungal chromophore of xanthomegnin (532 nm) or melanin (1064 nm), and thermal disruption of biofilms to result in a cost-effective, species-blind high-efficacy, and geriatric-safe approach to eradication of azole-resistant and MDR onychomycosis. For colleagues who don't have access to this otherwise easily available and affordable device, I shall dwell upon our team's novel innovation of successful repurposing of the Black Peel, a cosmetic peel for acne and pigmentation consisting black acetic acid, salicylic acid, tetrahydrojasmonic acid, bio sulphur, and potassium iodide for successful treatment of ONM, in combination with topical ciclopirox nail lacquer. The innovative use of chemical peel for ONM, although requires multiple sessions, it offers an excellent option in resource- and cost limited settings.

Conclusion: Q-switched laser and special chemical peels offer a drugfree, extremely safe, convenient, and efficacious option of successfully treating azole-resistant and MDR onychomycosis. The knowledge and acquisition of these skills have become essential for any practicing specialist in today's era of rampant drug-resistant pathogenic dermatophytic, candida and mold infections.

Speaker Biography

Amarendra Pandey is a Cosmetic Dermatovenereologist, Aesthetic Dermatologist and Dermatologist in Civil Lines, Jabalpur and has an experience of 7 years in these fields. He practices at Cosmasure in Civil Lines, Jabalpur. He completed DVD from DY Patil University in 2014, MBBS from Vikram University Ujjain in 2010 and MD - (Dermatology & STD) from University of Guyana Faculty of Health Sciences in 2015.

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