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Antifungal susceptibility testing of dermatophytes by agar based disk diffusion assay in tertiary care hospital in Nepal

Sundar Khadka^{1,2}, Jeevan Bahadur Sherchand², Bharat Mani Pokhrel², Subhash Dhital^{1,2}, Rosham Manjhi¹ and Basistha Rijal²

¹National Public Health Laboratory, Nepal

²Tribhuvan University Teaching Hospital, Nepal

Background: Dermatophytes are a homogenous group of fungi that live on the keratin of the stratum corneum, nails, and hair which have the ability to utilize keratin as a nutrient source in living animals including man. They are an important cause of superficial infections (dermatophytosis) affecting several millions of people worldwide and the risk of acquiring a dermatophyte infection in lifetime is estimated between 10–20%.

Methodology: We adopted a newly developed agar based disk diffusion assay to test susceptibility of 72 clinically isolated dermatophytes belonging to 5 species, *T. mentagrophyte* (44), *T. rubrum* (13), *T. tonsurans* (6), *M. canis* (6) and *E. floccosum* (3). The process involved the application of four commercially available anti-fungal disks namely Ketoconazole (15 µg), Miconazole (10 µg), Fluconazole (25 µg) and Clotrimazole (10 µg) for antifungal susceptibility testing. The four antifungal drugs were then applied to MHA plates and after which were incubated at 28°C for 5-10 days. After the growth of colonies on plates, the sizes of zone of inhibition around the antifungal disks were measured.

Results: The study shows that miconazole is most effective antifungal drug against dermatophytes followed by ketoconazole and clotrimazole. The test results of the susceptibility to antifungal drugs were as follows: Ketoconazole (15 µg): 60 (83.4%) sensitive, 8 (11.1%) intermediate, 4 (5.5%) resistance. Miconazole (10 µg): 68 (94.5%) sensitive, 1 (1.3%) intermediate, 3 (4.2%) resistance. Fluconazole (25 µg): 72 (100%) intermediate. Clotrimazole (10 µg): 63 (87.5%) sensitive, 9 (12.5%) resistance.

Conclusion: The disk diffusion method for antifungal susceptibility testing of dermatophytes species in this *in vitro* study may give insights into the application in therapeutic strategy against dermatophytic infections. Disk diffusion method is a simple and cost-effective for susceptibility testing of dermatophytes.

Biography

Sundar Khadka is currently working as Microbiologist at HIV Reference Unit, National Public Health Laboratory, Teku, Nepal with major responsibilities of HIV, HCV, HBV viral load testing.

cls.sundar@gmail.com

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