



March of Superficial Fungal Infection from Endemic to Epidemic in Bangladesh: A Sequence of Climate Change?

Mohammad Uzire Azam Khan*

Department of Physiology, University of Dhaka, Bangladesh

*Corresponding author: Md Uzire Azam Khan, Associate Professor and Head Department of Physiology, University of Dhaka, Bangladesh, Tel: +880 2-9661900; E-mail: uzire@yahoo.com

Received date: September 18, 2017; Accepted date: September 18, 2017; Published date: October 05, 2017

Copyright: © 2017 Khan MUA. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Editorial

Infections caused by pathogenic fungi and limited to the human hair, nails, epidermis, and mucosa are referred to as superficial fungal infections (SFI). SFI is distributed worldwide, can be transmitted person-to-person and has substantial morbidity [1].

Cutaneous mycoses are mostly caused by keratinophilic filamentous fungi called dermatophyte and are classified into three genera: Trichophyton, Microsporum and Epidermophyton. So far, about 30 species of dermatophytes have been identified as human pathogens [2]. The most common dermatophytes that cause cutaneous mycoses are *Trichophyton rubrum*, *Trichophyton mentagrophytes*, *Microsporum canis* and *Trichophyton tonsurans* [3]. Recently, clinical failure and relapses have been observed in patients treated with antifungals. Drug resistance has become an important problem leading to significant negative social, psychological, and occupational health effects and quality of life. Early recognition and treatment is essential to reduce morbidity and possibility of transmission [4]. *Epidermophyton* species affect nails and skin, *Microsporum* species affect hair and skin while *Trichophyton* species affect hair, nails and skin [5].

The incidence of fungal infections is increasing at an alarming rate, presenting an enormous challenge to healthcare professionals. World Health Organization estimates dermatophytes affect about 25% of the world population [6]. It is also estimated that 30 to 70% of adults are asymptomatic carriers of these pathogens, and that the incidence of this disease increases with age [6].

Recently, clinical failure and relapses have been observed in patients treated with antifungals. Drug resistance has become an important problem leading to significant negative social, psychological, and occupational health effects and quality of life. Early recognition and treatment is essential to reduce morbidity and possibility of transmission [6].

In Bangladesh, though the exact data is not known, it is observed in dermatology daily practice that incidence of superficial fungal infection, resistance to antifungal drugs and recurrence of superficial fungal attack have been increasing dramatically for last few years. Though not published, it is found in personal experience in private clinical practices that at least 1/3rd of patients with skin disease come with complaints of superficial fungal infection, mostly *Tinea cruris* (superficial fungal infection in groin and genital area), *Tinea corporis* (superficial fungal infection in body surface) and infection on other sites also, resistance to antifungal drugs and recurrence of disease after some weeks or months of successful treatment. Fungal culture is available but sensitivity is not easily available in Bangladesh. So it cannot be sure which antifungal agent is working effectively. Most of the cases lesions resolve and patients become cure but come with new

lesions after a period of interval that varies from 1-12 months. The available systemic antifungal drugs in Bangladesh are fluconazole, itraconazole, terbinafin, ketoconazole, griseofulvin. Though 2% ketoconazole shampoo is manufactured by at least five Bangladeshi pharmaceutical companies, ketoconazole soap is not manufactured by any of the Bangladeshi pharmaceutical companies. However, bathing with ketoconazole soap helps in eradication of fungus from body surface.

Climatic factors, as well as social practices, population migration and individual characteristics, such as immune status, may affect the epidemiology of dermatophytosis. In addition, some risk factors have also been associated with onychomycosis, such as age, morphological abnormalities in the nails, genetic factors, poor hygiene conditions and some diseases such as diabetes mellitus and immunodeficiency frames [7,8].

Bangladesh is tropical country. It has six seasons round the year. Among three seasons is actually perceivable-summer, rainy season and winter. Rest three seasons is short-lived, go unnoticeable or leave few evidence of their presence in the people's daily life. In winter the temperature of environment is less and humidity is also less which is unfavourable conditions for fungal growth in human skin. But during summer and rainy season the temperature as well as humidity is high. These conditions are good environments for budding of fungal spore and growth of fungal and cause superficial fungal infection on human skin.

The probable causes of recurrence are improper dosing of antifungal agent which includes less duration than is required for cure and/or under dosing, re-infection from other infected family members or from persons who come to close contact. The source of infection may be a patient not treated or inadequately treated. The source may be the clothing patient's use, which is not usually disinfected by boiling or adding chemicals to which fungus are susceptible. Clothing are not usually dried in sunlight and nor ironed properly. So fungus or spore may persist in the clothings, thought the patient has been effectively treated with suitable antifungal agents.

Nowadays most of the urban and semi-urban people wear thick clothings like pants made of jeans an gaverdin through which air cannot easily pass and it help sweat inside the clothings. They also use underwear (undergarments) which is also thick and similar to a half pant. They wear these clothings for a long period like 12 hours to 18 hours a day. During rest hour at home, they even wear three-quarter gaverdin trouser which are also unhealthy. Some dormitory dweller students often use to sleep wearing full length jeans pant.

Women usually wear cotton clothes. They always wear two to three pieces of clothing including two chest wears and several folds of saree

on the upper part of the body and two to three pieces of clothing including undergarments, petticoat and several folds of saree on the lower part of the body. These kinds of clothing create a hot and wet condition on the body surfaces which help fungus growth on skin. Women who work in kitchen also sweat profusely and suffer from superficial fungal infection.

Washing clothes, bed and pillow covers are not also satisfactorily hygienic. Clothes are washed with detergent powder and water. It may remove dust or other dirty things but it cannot kill fungus or destroy fungal spore. Destruction of fungal spore needs boiling which is not done in washing cloths nowadays. So clothing may harbour fungal growth, which may be the potential cause of recurrence of superficial fungal infection.

Any condition that decreases the immunity of body may fail to prevent fungal growth. The conditions that may decrease immunity are extreme ages (infants and elderly), diabetes mellitus, chemotherapy, malnutrition, congenital or acquired immunodeficiency.

Physicians do not address about these issues and don't talk about it but they should think and take necessary steps in this regard. Physician, pharmacists and other researchers should undertake researches immediately to find out the causes of drug resistance and recurrence of infection. Public health personnel should watch the hygiene condition of the people suffering from superficial fungal infection. Hospitals and diagnostic laboratories should enrich their microbiology department to enable find out fungus culture and its sensitivity to drugs. Existing pharmaceuticals should seek new drugs that are less toxic and more effective in fighting fungus. Ketoconazole soap and other antifungal soap should be manufactured by local pharmaceuticals and make it available to patients in a reasonable price.

Hope lie in the information that researchers aim to discover new antifungal agents either by testing already existing medical compounds, compounds from natural sources such as plants, sea, microorganisms or by systematic screens of chemical compound libraries [9].

References

1. Kelly BP (2012) Superficial fungal infections. *Pediatrics in Review* 33: e22-e37.
2. White TC, Oliver BG, Graser Y, Henn MR (2008) Generating and testing molecular hypotheses in the dermatophytes. *Eukaryot Cell* 7: 1238-1245.
3. Banerjee M, Ghosh AK, Basak S, Das KD, Gangopadhyay DN (2011) Comparative evaluation of effectivity and safety of topical amorolfine and clotrimazole in the treatment of *Tinea corporis*. *Indian J Dermatol* 56: 657-662.
4. Nigam PK (2015) Antifungal drugs and resistance: Current concepts. *Our Dermatol Online* 6: 212-221.
5. Tyagi S (2016) Fungal pathogenicity and diseases in human: A review. *Journal of Pharmacognosy and Phytochemistry* 5: 192-1093.
6. Nalu Teixeira de Aguiar Peres (2010) *An Bras Dermatol* 85: 657-667.
7. Drake LA, Dinehart SM, Farmer ER, Goltz RW, Graham GF, et al. (1996) Guidelines of care for superficial mycotic infections of the skin: *Tinea corporis*, *Tinea cruris*, *Tinea faciei*, *Tinea manuum* and *Tinea pedis*. *J Am Acad Dermatol* 34: 282-286.
8. Seebacher C, Bouchara JP, Mignon B (2008) Updates on the epidemiology of dermatophyte infections. *Mycopathologia* 166: 335-352.
9. Vandeputte P, Ferrari S, Coste AT (2012) Antifungal Resistance and New Strategies to Control Fungal Infections. *International Journal of Microbiology* 2012: 1-26.