



Screening of scalp infection and antifungal activity of commercially available shampoo against the isolates among the leprosy patients

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Received: 22/10/16

Revised: 07/11/16

Accepted: 21/11/16

Abstract: Leprosy affects mainly those areas of skin which have a relatively lower temperature and are more exposed to trauma. Certain zones like scalp, palms and soles, genitalia, groins, axillae, eyelids, transverse band of skin over lumbosacral area, midline of back and perineum have been described to be immune to the development of lesion. . *Tinea capitis* (scalp ringworm) is a cutaneous fungal infection (dermatophytosis) of the scalp. The diseases is primarily caused by dermatophytes in the *Trichophyton* and *Microsporum* genera that invade the hair shaft. Fifty volunteer leprosy patients were subject to the study. The scalp samples were collected and plated on Potato Dextrose Agar plates. Commercially available shampoos were screened for antifungal activity and shows significant activity. The antifungal sensitivity for the isolates were tested and found to exhibit drug resistant.

Key words: Leprosy, Dermatophytes, *Trichophyton*, *Microsporum*, Potato Dextrose Agar, *Tinea capitis*

INTRODUCTION

Leprosy, caused by *Mycobacterium leprae*, is an age-old disease which until recently affected millions of people in Asia, Africa and Latin America. Although it was once widely prevalent in Europe, it is practically non-existent today. Leprosy is feared mainly because of the deformities it produces and the consequent social stigma and discrimination. The disease primarily affects the skin and peripheral nerves. It can also affect the upper respiratory tract, eyes, liver, testes, muscles and bones [1]. The scalp is considered to be one of

the immune zones of leprosy. Though rare, there are some cases reported in the literature, mostly in the multibacillary patients with lesions of leprosy on the scalp [2,3].

The visual perception of individually distinguishable flakes on the scalp, in the hair, or on the clothing is considered an abnormal condition frequently referred to as dandruff, seborrheic dermatitis, or multiple other names [4,5]. *Tinea cruris*, *T. corporis* and *T. pedis*, named for the body sites involved, are superficial fungal infections caused by *Trichophyton*, *Microsporum* and *Epidermophyton* [6]. These dermatophytes require

keratin for growth, they are restricted to hair, nails, and superficial skin; therefore, most can be treated with topical antifungal medications [7]. The estimated lifetime risk of acquiring *Tinea* infections is between ten and 20 percent [8]. Currently available treatment options for the management of dandruff include therapeutic use of antidandruff shampoos containing keratolytics, antimicrobials like Zinc pyrithione, Selenium sulphide, Salicylic acid, Imidazole derivatives, Sulphur Coal tar [9]. The present study focused to screen the scalp infection and antifungal activity of commercially available shampoo and drugs against the chosen isolates.

MATERIALS AND METHODS

Fifty volunteer leprosy patients who are the inmate of Government Rehabilitation Centre for Leprosy, Pudhupatti, Madurai were subject to the study. The study population involved around 33 males and 17 female with varying degree of deformity.

Sample collection: The samples were collected from scalp of the leprosy patients using sterile swab and then this swab were placed in a tube containing sterile peptone broth and immediately transported to the laboratory

Isolation of Dermatophytes: The scalp samples were swabbed onto potato dextrose agar plates. All the plates were incubated at 37°C for 24 -48 hours. The identification of dermatophytes was based on the macro and microscopic characteristics of their colonies grown on routine medium or special medium for diagnosis.

Direct examination: A wet film was prepared with 10% KOH or saline with a cover slip and examined under 10x and 40x objectives. Several fields were

transverse for the presence of budding cells and for dermatophytes.

Sensitivity test : The antibiotic sensitivity for the entire isolates was tested by Kirby-Bauer method [10]. The antifungal discs were obtained from HiMedia laboratories, Mumbai. 48 hours culture of isolates were swabbed onto the Muller Hinton Agar plates. Antifungal disc were placed on the media swabbed with fungal isolates. The plates were incubated for zone of inhibition at 37°C for 24 hours. Recommended antifungal drugs used such as Ketoconazole, Itraconazole, Fluconazole and Cotrimazole. Shampoos used for anti-fungal sensitivity tests were Head & Shoulders (silky black), Head & Shoulders (cool menthol), Clinic All Clear, Pantene, Nizoral, Himalaya, Ayush and Garnier.

RESULTS AND DISCUSSION

Leprosy presents a clinical spectrum ranging from the tuberculoid form (TT) with lesions that are often self-healing to the disseminate and progressive lepromatous form (LL). Within this spectrum, there are borderline forms with intermediate lesion between the two polar forms. Down regulation of immune response and personal cleanliness makes the leprosy patients susceptible for scalp infection. If left untreated it may lead to skin associated diseases. The present study was directed to identify the co- infection pattern among leprosy patients. Scalp samples were collected to identify the presence of isolates. The sex wise distribution of leprosy patients were shown in Fig.1. Figure 2 represent the age wise distribution of leprosy patients. The therapeutic involvement of scalp infection among leprosy patient were depicted in fig. 3. The prevalence of *Trichophyton* and *A. niger* was found to be highly significant compared to *Microsporum* and *A. fumigates*. Most of the female leprosy patients were infected with *Trichophyton* and *Microsporum* whereas high

percentage of the males was infected with *A. niger* and *A. fumigatus* (Fig.4 and 5).

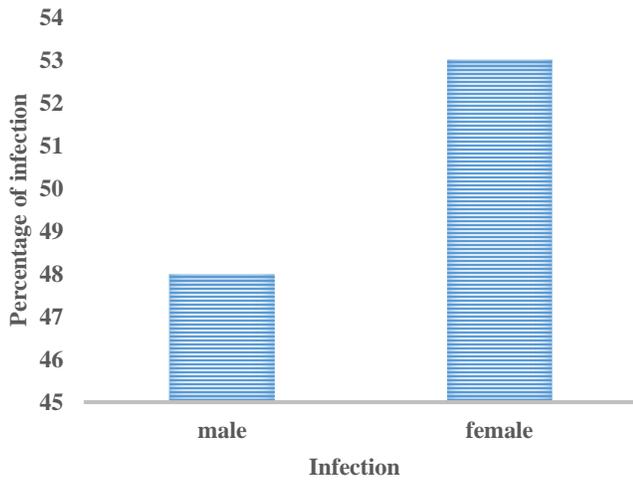


Fig.1. Sex wise distribution of scalp infection susceptibility among leprosy patients

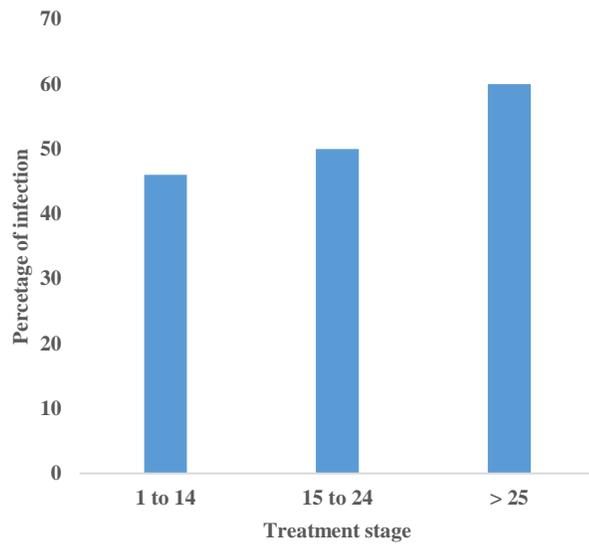


Fig 3. Therapeutic involvement of scalp infection among leprosy patient

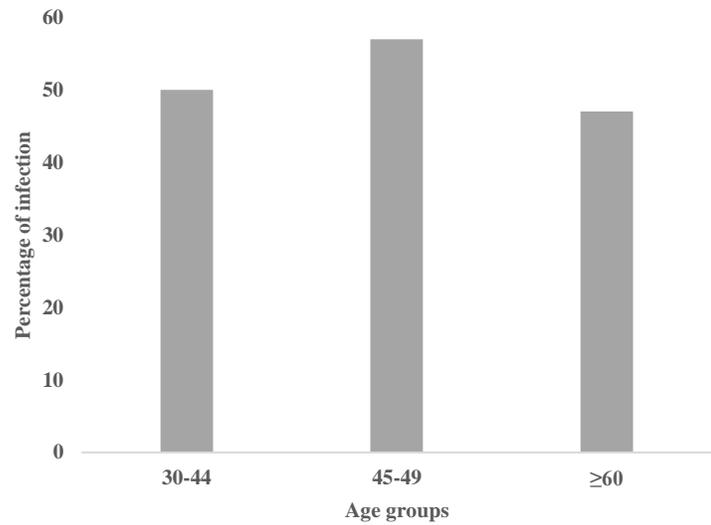


Fig 2: Age wise distribution of scalp infection among leprosy patients

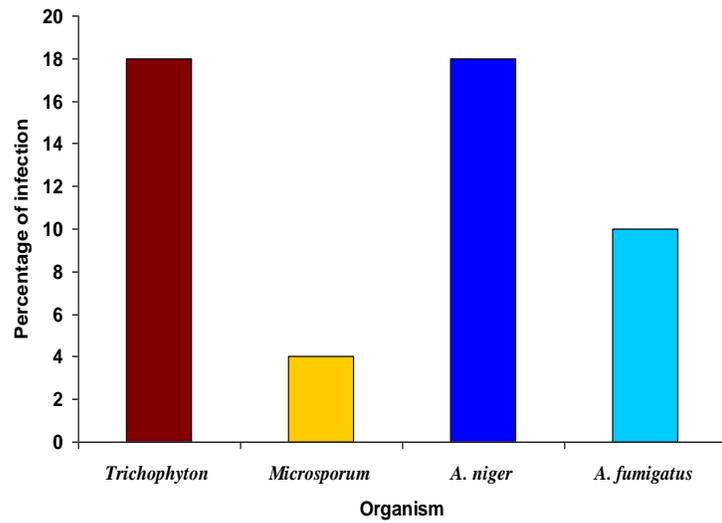


Fig.4. Percentage wise prevalence of isolates in scalp infection among leprosy patients.

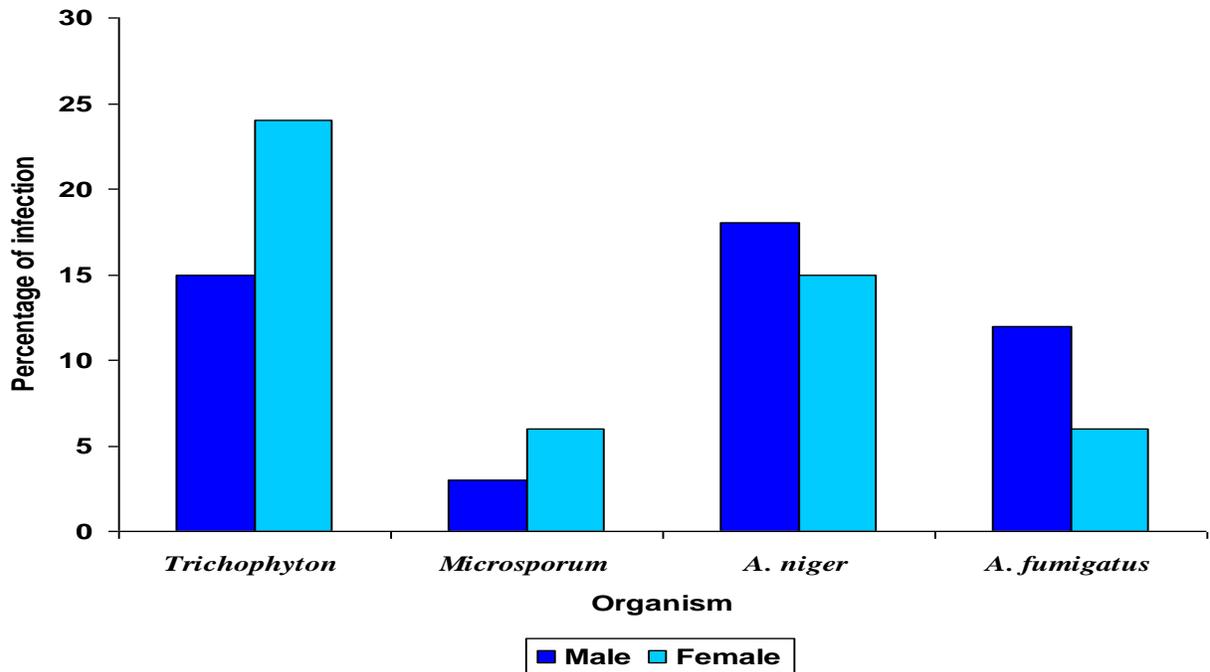


Fig 5. Sex wise percentage of isolates in scalp infection among leprosy patients

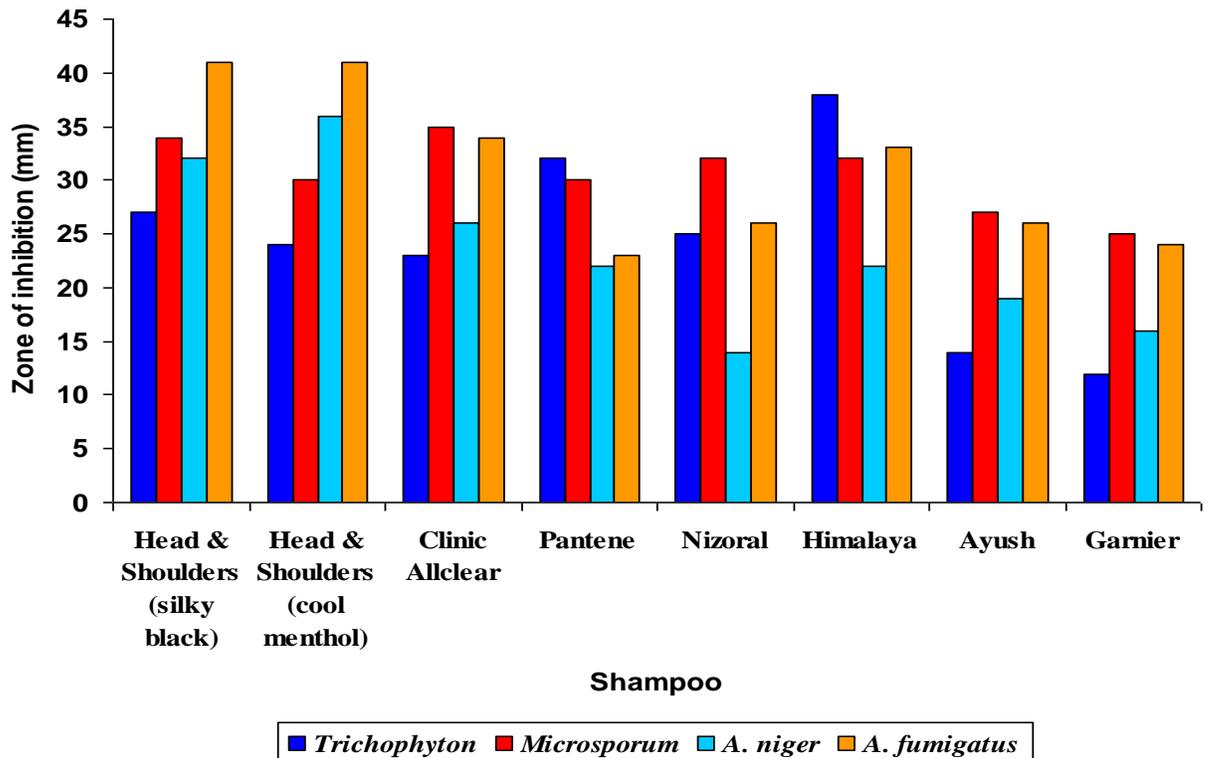


Fig. 6 Antifungal activity of commercially available shampoo against scalp isolates among leprosy patients

Antifungal activities of commercially available shampoo against scalp isolates were represented in fig.6. The percentage of resistance among fungal isolates to various drugs. All the isolates were found to be resistant to drugs.

Tinea capitis is a superficial fungal infection of the scalp. The disease is primarily caused by dermatophytes in the *Trichophyton* and *Microsporum* genera. Treatment of *Tinea capitis* requires an oral antifungal agent, griseofulvin, the most commonly used drug, but other newer antimycotic drugs have started to gain acceptance. The presence of other non – dermatophytes (particularly *Aspergillus* species) may be due to the ubiquitous nature of their spores in our environment carried transiently on healthy skin. Transmission between hosts usually occurs by direct contact with a symptomatic or asymptomatic host or direct air borne contact with its hairs or skin scales. Infective species, which is the clear evidence of immune down regulation in leprosy patients against the fungal isolates. Antifungal therapeutic management showed strategies of resistant stating the failure of therapeutic interventions against scalp infection.

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Commercially available shampoos were screened for antifungal activity against the scalp isolates and were found to possess promising activity.

spores in hair and dermal scales can remain viable for several months to years in the environment [11].

Our present study documents the highest occurrence of *Trichophyton* and *Aspergillus*

CONCLUSION

The study concludes that *Trichophyton* and *A.niger* was found to be high cause of scalp infection. Commercially available shampoo were screened for antifungal activity. The fungal isolates were sensitive to all the shampoo except *Trichophyton*, which was resistant to Ayush and Garnier and *A. niger* that showed resistance to Nizoral.

ACKNOWLEDGMENTS

The authors thank the authorities of the American College for facilities and encouragement

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