Int.J.Curr.Microbiol.App.Sci (2018) *7*(1): 762-765

International Journal of Current Microbiology and Applied Sciences
***ISSN: 2319-7706* Volume 7 Number 01 (2018)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2018.701.092

Study of Clinico-Mycologic Profile and Antifungal Susceptibility Pattern of Dermatophytic Infection in the North-Western Zone of Rajasthan, India

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Keywords

Dermatophytoses, Tinea, Trichophyton, Antifungal susceptibility

Article Info

Accepted:
06 December 2017
Available Online:
10 January 2018

A B S T R A C T

Dermatophytoses broadly includes superficial fungal infection of skin, hair and nail. In India dermatophytic infection are very common superficial fungal infections due to hot and humid climate in most of the part of country**.** A study was planned to find clinico-mycological profile of dermatophytic infection in our arid zone along with study of predisposing factors and to find out species commonly involved. To guide the clinician regarding therapeutic options antifungal susceptibility was carried out. Prospective study was carried out on 100 patients of suspected dermatophytoses attending our tertiary care institute. Skin scrapings and nail clipping were taken and subjected to KOH mount and culture on SDA agar, fungus was identified and antifungal susceptibility was carried out by microbroth dilution method as per CLSI recommendations. Total of 100 samples, 92 were KOH positive and 8 were KOH negative. 80 samples found positive for fungus by culture and *T. mentagrophyte* (26) was prime isolate followed by *T. rubrum* (18), *T. interdigitale* (11) and *T. verrucosum* (3) isolates were sensitive to Itraconazole (61) followed by Terbinafine (59), Fluconazole (58) and Griseofulvin (55). Most of the Indian studies have shown that dermatophytoses are more prevalent in Southern and Eastern part of country however no study on dermatophytoses with their antifungal sensitivity was available in this part of country hence study had shown that dermatophytoses is prevalent in this part of country.

Introduction

The cutaneous mycoses mainly caused by dermatophyte fungi are among the most common fungal infections worldwide, affecting several age groups and adversely affecting the quality of life of infected patients (Azulay *et al.*, 2008; Peres *et al.*, 2010). Dermatophytosis broadly includes superficial fungal infection of the skin, hair and nail though it doesn't cause mortality, it does leads to morbidity and is responsible for major health problem. India has a varied topography however large part of India has hot and humid climate during summer and mansoon dermatophytoses are very common superficial fungal infection (Singh and Beena, 2003). The disease has a wide geographical distribution, no part being completely free from it. Five to six species are prevalent globally. *Trichophyton rubrum* is being the commonest. Clinically manifestation vary depending on the causal agent and on the host immune response, they may last for month or

years or may be asymptomatic or manifest only as pruritis. Infection may manifest as blister, fissures, scales or spots (Turchin *et al.*, 2005; Somenzi *et al.*, 2006).

The diagnosis of dermatophytoses is primarily established by observation of clinical presentation and by characteristic distribution of lesions diagnostic confirmation may be done by KOH mount and mycological culture. The choice of adequate treatment is determined by the site and extent of lesions, the fungal species involved and the efficacy, safety profile and pharmacokinetics of the available antifungal agents (Kassem *et al.*, 2006).

The main aim of this study to find clinico-mycological profile of dermatophytic infection in this arid zone and to detect dermatophytic species isolated in keratinous tissues.

Morphological identification of fungus in dermatophytic infection by culture and microscopic technique.

Study of correlation between dermatophytes and different predisposing factors, social status, locality, age, sex, symptoms, occupation and seasonal variations.

And also to find out antifungal susceptibility pattern in isolated dermatophytic species in this zone so that appropriate therapeutic options can be determined.

Materials and Methods

Prospective study was carried out on 100 patients of suspected dermatophytoses attending department of skin and VD, Sardar Patel Medical College, PBM hospital Bikaner, cases were diagnosed on the basis of typical clinical manifestation inclusion criteria were clinically diagnosed fresh cases of 15-65 years age who have not taken treatment for previous fungal infection and found seronegative for HIV, HBV and HCV. Skin scrapping and nail clipping were taken and subjected to KOH mount and culture on SDA agar. Gross identification and LPC mount were made and isolates were identified. Antifungal sensitivity test was performed by using micro broth dilution method as per CLSI recommendation (Reference Method for Broth Dilution Antifungal Susceptibility Testing of Filamentous Fungi). Following antifungals were used for antifungal sensitivity testing-Fluconazole, Itraconazole, Terbinafene and Griseofulvin. The MIC was measured in µg/ml and results recorded for each isolate separately as sensitivity resistant and intermediate.

Observation

Present study was conducted from Sept. 2015 to Aug 2016. Maximum number of positive cases 48 (60%) were obtained during May to August while least no. of cases 32 (40%) were positive in month of Sept to April.

Maximum cases were in age group 15-24yr (40%) followed by 25-34yr (22%) and 35-44yr (19%). Outdoor activity is maximum in young age which decreases with age.

Males were more commonly affected 68% rather than females' 32% ratio of 2.1:1 showing male predominance.

Out of 100 cases highest number were farmers 23 followed by labourers 22, housewives 16, students 14, servants 08, drivers 04, teacher 04 etc.

Infection was more prevalent in workers rather than service class people.

Total of 100 samples 92 were KOH positive, 8 were KOH negative out of these 2 were culture positive.

Among 92 KOH positive 78 were positive by culture and 14 cases were KOH positive but culture negative.

T. mentagrophyte was the prime isolate from *T. cruris* similarly *T. rubrum* and *T. interdigitale* were recovered more commonly from *T. cruris*. *T. verrucosum* was common isolate from *T. faciei* and *M. gypseum* was common isolate from *T. corporis*. 2 cases of *M. nanum* were isolated from *T. cruris* and *T. corporis*. *T. unguium* (onychomycosis) was mainly caused by Candida species 36.84% followed by *T. rubrum* (21.05%) and *T. mentagrophyte* (15.79%).

Out of total 63 Dermatophyte isolates in our study 61 were found sensitive to Itraconazole followed by Terbinafine 59, Fluconazole 58 while 55 were sensitive to Griseofulvin.

Results and Discussion

In our study the commonest species isolated were *Trichophyton mentagrophyte* (32.50%) followed by *T. rubrum* (22.50%), *T. interdigitale* (13.75%), *T. verrucosum* and *M. gypseum* (3.75%), *M. nanum* (2.50%) and Candida species (8.75%) whereas *T. rubrum* was commonest species in a study from Northern Italy (Sara Asticcioli and Adriano Di Silverio, 2008), Gujrat (Parul Patel and Summaiya Mulla, 2010). Similar reports are from Himachal Pradesh (Vikesh Kumar Bhatia and Prakash Chand Sharma, 2014). This finding is contrary to the observation from others (Sara Asticcioli and Adriano Di Silverio, 2008; Parul Patel and Summaiya Mulla, 2010) in which a reverse trend has been reported reason for this could be geographical variation, chronicity of lesion and climatic difference.

In present study maximum clinical presentation were *T. cruris* (27) and *T. unguium* (25) and most frequently affected age group was 15-24yr (40%). The incidence was low in elderly age group. Similar observations were made by others also (Hiral K. Patel *et al.*, 2016; Sachin Kumar and Seema Bhadauria, 2016). Dermatophytoses were observed more in male (68%) as compared to females (32%). Cases were more during the month May to August (60%) as compared to September to April (40%). This type of seasonal variation has also been reported by a study from Mysore India (Jha and Mahadeva Murthy, 2013). The probable reason of this could be due to more sweating and dusty environment in this North West region of Rajasthan.

We observed field workers were more affected by disease as compared to indoor workers reason could be more exposure to soil, dust and moisture.

T. cruris (27%) was commonest clinical presentation followed by *T. unguium* (25%) and *T. corporis* (22%). In contrast to study from Gujarat, Amritsar, Surat and Ahmedabad where they found *T. corporis* as commonest clinical presentation[11] reason could be difference in life style of people living in different states.

Sixty three Dermatophyte isolates were subjected for antifungal susceptibility by micro broth dilution method as per CLSI recommendation and 61 isolates were found sensitive to Itraconazole followed by Terbinafine (59), Fluconazole (58), while 55 isolates were found sensitive to Griseofulvin. Similar results had been reported by other authors also (Keyvan Pakshir and Leila Bahaedinie, 2009).

As reported by earlier workers isolation of the non dermatophyte molds from skin and nail samples were regarded as contaminant but now their emergence as casual agents of superficial mycoses needs evaluation and

repeat isolation from same site makes their significance. The non dermatophytic mold isolated in our study were *Fusarium* species and *Aspergillus* species.

In short most of the Indian studies shown that dermatophytoses are more prevalent in southern and Eastern region of the country however no study on dermatophytoses with their antifungal sensitivity is available in North-West Rajasthan therefore present studies shows that dermatophytoses is also prevalent in this part of country.

Acknowledgement

We are thankful to Dr. Shukla Das, Professor UCMS New Delhi for carrying out antifungal sensitivity of isolates.

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How to cite this article:

Mukesh Kumar, Taruna Swami, Sanju Pannu, Shyama Datt and Ravindra Kumar. 2018. Study of Clinico-Mycologic Profile and Antifungal Susceptibility Pattern of Dermatophytic Infection in the North-Western Zone of Rajasthan, India. *Int.J.Curr.Microbiol.App.Sci.* 7(01): 762-765. doi: https://doi.org/10.20546/ijcmas.2018.701.092