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Original Research Article

Mycological Profile of Superficial Mycoses in North Maharashtra, India

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ABSTRACT

Background: Superficial mycoses of the glabrous skin are among the most prevalent of human infectious diseases. The etiological agents comprise dermatophytes and yeast infections. Superficial mycoses are believed to affect 20% to 25% of the world's population and the relative occurrence of the etiologic agents of these infections varies from country to country. The present study was aimed at detecting the prevalence of dermatophytosis infection and etiological agent in rural North Maharashtra.
Material & Methods: Clinical specimens like skin scrapping, infected hair and clipped nails were collected in small paper envelopes after cleaning the area with 70% alcohol. All specimens were subjected to direct microscopy for fungal elements in 10% / 20% (for nail) KOH and culture in Sabouraud's Dextrose Agar (SDA) with Chloramphenicol antibiotics and Dermatophyte Test Medium (DTM). All necessary methods were undertaken for microscopic morphology.
Results: Diagnosis confirmed by microscopic examination in 126 cases (67%), and the etiological agents were isolated in 102 cases (53.92%). Dermatophytes, *P. versicolor* and *Candida albicans* were the major etiological agents isolated. Tinea corporis accounted for 51.96% (72.34%) occurred in age > 20 years of age. The frequency of other clinical types was *Pityriasis versicolor* 28.44% followed by Candidiosis 11.76%. *Trichophyton rubrum* was responsible for 32% of all dermatophyte infections. Followed by *P. versicolor* (28.44%) , *Trichophyton mentagrophytes* (24.60%) and Candida species (11.76%).
Conclusion: Non - dermatophytic fungi, dermatophytes were emerging as important causes of superficial mycosis. Cultures along with direct microscopy using KOH preparation were important method of definitive diagnosis of fungal infections.

Key words: Superficial mycoses, Dermatophytes, *Trichophyton rubrum*, Tinea corporis, *M. canis*

INTRODUCTION

Superficial mycoses of the glabrous skin are among the most prevalent of human infectious diseases seen in clinical practice.[1] Superficial mycoses refers to the disease of skin and its appendages caused by fungi.[2]

The etiological agents comprise dermatophytes and yeast infections, including candidiasis and pityriasis versicolor.[3] These fungi have the capability to produce keratinase, which allows them to metabolize and live on human keratin like skin, nail and hair.[4]

Tinea capitis and tinea corporis are most frequently seen in children, while tinea unguium, tinea pedis and tinea versicolor are more common in adults.[5]

Superficial mycoses are believed to affect 20% to 25% of the world's population and the incidence continues to increase.[6] The relative occurrence of the etiologic agents of these infections varies from country to country.[7]

Although superficial mycoses does not produce mortality, it causes morbidity and pose a major health problem in tropical countries like India due to a warm and humid climate, crowded living and poor sanitary conditions which promote the spread of these infections.[8]

The present study is aimed at detecting the prevalence of dermatophytosis infection and etiological agent in rural Dhule, Maharashtra.

MATERIAL AND METHODS

Sample selection: A total of 186 patients having age range of 1 – 60 years suspected to have dermatomycotic infections were randomly selected from outdoor patients of the Skin and Venereal Disease Section of our rural Medical College and Hospital, Dhule from July 2012 to June 2013, covering all seasons of a year. A detailed clinical history including age, sex, duration, site and extent of infection, type of lesion, antifungal therapy and occupation of patients was taken. Patients were examined and grouped in different clinical types depending upon the site of involvement.

Sample collection: Samples were collected from skin, hair and nail using a sterile scalpel blade following cleaning of the affected sites with 70% alcohol. The scrapings were collected on a piece of sterile paper. The samples were divided into two portions: one for microscopic examination and the other for culture. The collected samples were transported to the laboratory within 2 hours for microscopic and cultural analysis.

Sample processing

Direct microscopic examination: Direct microscopic examination of scales and broken-off hairs placed on a microscope slide with one or two drops of 10-20% Potassium hydroxide (KOH). The sample was warmed for 5 minutes over a flame as described by Behl.[9] Each slide was carefully examined under low (×10) and high (×40) power objective for the presence of hyphae and/or conidia.

Fungal culture: Each scraping was cultured into Sabouraud's dextrose agar. The slants were incubated at 28°C for up to 4 weeks and examined at 2 to 3 days intervals for fungal growth. Fungal isolates were examined visually and microscopically for morphology of the fungi using Lactophenol Cotton Blue by slide culture technique. The dermatophytes were confirmed by Dermatophyte test medium, incubated at 30°C for 14 days. All Candida albicans isolates were tested for germ tube production in human serum as well as for chlamydospores formation on corn meal agar plus Tween80.

As Pityrosporum is a normal skin commensal, scraping from clinically diagnosed cases of P. versicolor were subjected to KOH mount only and not cultured. The culture studies and identification were done by standard methods.[2,10-12]

RESULTS

A total of 188 samples were obtained from patients with suspected superficial mycoses, comprising 119 (63.30%) male and 69 (36.70%) female. Diagnosis was confirmed by microscopic examination in 126 (67%) and etiological agents were isolated in 102 (53.92%) cases. Dermatophyte species 61 (59.80%) were the most common from the total isolates

identified by culture followed by *Pityriasis versicolor* 29 (28.44%) and Candida species 12 (11.76%).

Tinea corporis was predominant form of all dermatophyte infection according to the anatomical site involvement, out of which 72.34% cases were > 20Yr. of age. Tinea pedis was found more frequently in adults. T. rubrum was the common etiological agent in Tinea corporis and second common in other form of infection.

Table No. 1:- Frequency of Superficial mycoses.

Sr. No.	Etiological agent	Frequency (%)
A.	Dermatophyte species	61 (59.80%)
1.	*T. rubrum*	32 (52.46%)
2.	*T. mentagrophytes*	15 (24.60%)
3.	*T. violaceum*	6 (9.84%)
4.	*M. canis*	5 (8.20%)
5.	*E. flocossum*	2 (3.28%)
6.	*T. tonsurans*	1 (1.64%)
B.	P. versicolor	29 (28.44%)
C.	Candida species	12 (11.76%)
1.	*C. albicans*	6 (50%)
2.	*C. glabrata*	4 (33.33%)
3.	*C. parapssilosis*	2 (16.67%)

Table No. 2: Frequency of Dermatophyte infections in cutaneous mycoses.

Sr. No.	Etiological agent	Number	Tinea corporis	Tinea pedis	Tinea barbae	Tinea cruris
1.	*T. rubrum*	32	28 (52.83%)	3 (50%)	0	1 (100%)
2.	*T. mentagrophytes*	15	12 (22.64%)	2 (33.33%)	1 (100%)	0
3.	*T. violaceum*	6	5 (9.43%)	1 (16.67%)	0	0
4.	*M. canis*	5	5 (9.43%)	0	0	0
5.	*E. flocossum*	2	2 (3.77%)	0	0	0
6.	*T. tonsurans*	1	1 (1.89%)	0	0	0
	Total	61	53 (86.88%)	6 (9.84%)	1 (1.64%)	1 (1.64%)

Infection of glabrous skin like neck, back & chest was commonly associated with P. versicolor, which was found frequently in adult males 21 (72.41%) than in females 8 (27.59%).

Superficial candidiasis was mainly found in female patient which was due to C. albicans 6 (50%) and other Candida species isolated were *C. glabrata* 4 (33.33%) & *C. parapsilosis* 2 (16.67%). The common affected sites were axillary 7 (58.33%), hands 3 (25%) and feet 2 (16.67%).

DISCUSSION

Fungal infections are extremely common in tropical countries like India. Although superficial mycoses do not produce mortality, it causes morbidity and may spread to other individual or become invasive. Most superficial mycoses are easily diagnosed and readily treated.[4]

Total 188 cases were studied for superficial mycoses. Persons of all ages were susceptible but most of the cases of fungal infection 136 (72.34%) occurred >20 years of age with most of patients were seen in 3rd decade 60 (31.91%) followed by 2nd decade 34 (18.08%). Our study results correlates with study carried out by Sarma et al [13] & Patel et al.[14]

Male to female ratio was 1.72 : 1. Highest frequency in male adults has been reported in India & abroad, due to high outdoor physical activity.[15]

Tinea corporis was the common infections were reported in males. The findings are correlates with other studies.[5, 16]

T. rubrum was the most common dermatophyte isolated from various lesions followed by *T. mentagrophytes* which is consistent with our study results.[14,18]

T. rubrum was the main isolate from cases of Tinea corporis, which is well correlates with study carried out by atel et al.[14] & Aruna Aggarwal et al.[17]

Cutaneous candidiasis was found to be an important agent, particularly in females, which correlated with other studies.[5] This may be due to females usually harbor *C albicans* vaginally or *C. parapsilosis* on glabrous skin.[19]

Isolation rate was more by direct microscopy using KOH preparation 126 (67%) than culture 102 (53.92%), which correlated with Patel et al.[14]
67 (35.64%) specimens were positive by direct microscopy alone and 6 (3.19%) were positive by culture alone, emphasize the significance of both microscopy & culture in definitive diagnosis of fungal infection.

CONCLUSION

Non dermatophytic fungi along with dermatophytes are also emerging as significant causes of superficial mycoses. Cultures along with direct microscopy using KOH preparation are important method of definitive diagnosis of fungal infections.

REFERENCES

1. Rudy SJ. Superficial fungal infections in children and adolescents. Nurse Pract. Forum. 1999; 10:56 – 66.
2. Grover WCS, Roy CP. Clinico–mycological Profile of Superficial Mycoses in a Hospital in North-East India. Medical Journal Armed Forces India 2003; 59:2:114 – 116.
3. Ayler R. Ecology and epidemiology of dermatophyte infections. J Acad Dermatol 1994; 31(Suppl. 2):S21 – 25.
4. Das K, Basak S and Ray S. A Study on Superficial Fungal Infection from West Bengal: A Brief Report J Life Sci 2009; 1:1: 51 – 5.
5. Venugopal PV, Venugopal TV. Superficial mycoses in Saudi Arabia. Australas J Dermatol. 1992; 33:45 – 8.
6. Havlickova B, Czaika VA, Friedrich M. Epidemiological trends in skin mycoses worldwide. Mycoses 2008; 51(Suppl. 4):2 – 15.
7. Korstanje MJ, Staats CC. Fungi infection in the Netherlands: Preventing fungi and pattern of infection. Dermatology 1995; 1: 39 – 42.
8. Abdel-Rahman SM, Nahata MC. Treatment of Tinea capitis. Ann Pharmacother. 1997; 31: 338 – 348.
9. Behl PN. Practice of dermatology. 7th Ed. CBS Publishers and Distributors, Delhi; 1990: 895.
10. Chander J. Superficial Cutaneous Mycoses. In: Textbook of Medical Mycology. 2nd Ed. Mehta Publishers, New Delhi, India; 2009: 92 – 147.
11. Collee JG, Fraser AG, Marmion BP, Simmons A. Fungi. In: Mackie McCartney Practical Medical Microbiology, 14th Ed. Churchill Livingstone, UK; 1996: 695 – 717.
12. Koneman EW, Allen SD, Janda WM, Schreckenberger PC, Winn WC. Mycology. In: Color Atlas and Text book of Diagnostic Microbiology, 5th Ed. Lippincott Williams and Wilkins, USA; 1997: 983 – 1069.
13. Sarma S. Borthakur AK. A Clinico – Epidermatological Study of Dermatophytoses in Northest India. Indian J of Dermatol Venereol Leprol 2007; 73:6: 427 – 428.
14. Patel P, Mulla S, Patel D, Shrimali G. A study of superficial mycoses in south Gujarat region. National Journal of Community Medicine 2010, Vol. 1 (2): 85 – 88.
15. Singh S. Beena P M. Profile of Dermatophyte Infections in Baroda. Indian J of Dermatol Venereol Leprol 2003; 69:4: 281 – 283.
16. Ayadi A, Borgi N, Makni F. Prevalence of superficial mycoses in an urban ecosystem in Sfax (Tunisia). Bull Soc Pathol Exot 1993; 86: 188- 189.
17. Aggarwal A, Arora U, Khanna S. Clinical and Mycological Study of

Superficial Mycoses in Amritsar. Indian J dermatol 2002; 47:4: 218 – 220.
18. Kennedy K A, Anupma Jyoti K A, J. Kalyani A, Anandan S. Clinico – Mycological Profile Of Dermatophytic Skin Infections In a Tertiary Care Center – A Cross Sectional Study. Sri Ramachandra Journal of Medicine 2007; 1: 2:12 – 15.
19. Odds FC. Candida and candidiasis. 2nd edition. London: Bailliere Tindall, 1988:77 – 82.

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